

THE
RAILWAY GAZETTE

A Journal of Management, Engineering and Operation
INCORPORATING

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Major-General de Candolle

BY the death on January 25 of Major-General Raymond de Candolle we have lost a distinguished railwayman who gave generous service to the Allied cause during the war in many different ways. Though of Swiss parentage, he was brought up in England, and after leaving Cambridge took up railway work in various directions. From 1908 to 1911 he was Assistant General Manager of the Buenos Ayres Great Southern Railway, and after 1911 he visited the United States and Canada as a special agent for the four great Argentine railways to investigate the methods adopted in connection with the storage and transportation of grain, and made a valuable report on the subject. On his return to South America he took charge, as Manager and Engineer, of the construction of a Brazilian line giving access to a rich iron mine. On January 1, 1914, he became General Manager of the Buenos Ayres Great Southern Railway, but early in the war resigned this important position in order to place his services at the disposal of the Allies. In May, 1917, he was placed by the British Government at the head of an important railway mission in Roumania, with the temporary rank of Brigadier-General, and in recognition of his work in this capacity was created a C.B. in 1918. After his return to England he was sent out to Mesopotamia, with the rank of Major-General, to supervise transport. In September, 1921, he was appointed General Manager of the Ottoman Railway from Smyrna to Aidin,

but retired from railway work in March, 1923, owing to weakened health.

* * * *

Persia or Iran

Claiming that the word Persia is derived from Pars or Fars, which is but one province of the modern country, the Persian Government has decided that the name long familiar to Western ears does not properly represent the country. It has therefore been announced that from March 21 next the Persian new year day, the name Iran, by which the country is known domestically and generally in the East, is to be substituted. Since the war a wave of name changing has all but submerged the value of our school geography, and the familiar Constantinople, Christiania, and Petersburg have given place to Istanbul, Oslo, and Leningrad. Moreover, new countries have sprung up and adopted unfamiliar nomenclature, but we can recall no other instance of an old-established State notifying its embassies and legations to carry into effect such a change as Persia now orders. Apart from the unfortunate similarity of Iran with Iraq (its neighbour), Europeans will probably for long use the name Persia through habit, if not as permanently as we in England know Deutschland as Germany; and *The Times* aptly reminds us that we shall surely continue to stroke Persian and not Iranian cats.

* * * *

The Week's Traffics

Passenger train earnings of the group railways continue to improve and for the four weeks to date this traffic for the four companies together amounts to £3,991,000, an increase of £122,000 or 3.15 per cent. Merchandise receipts for the same period, however, are down except for an increase of £20,000 on the Great Western. These receipts amount to £3,800,500, a net decrease of £37,000. For the corresponding period in 1934 there was an increase of £546,500.

	4th Week				Year to date.	
	Pass., &c.	Goods, &c.	Coal, &c.	Total.	Inc. or dec.	%
L.M.S.R. .. +	6,000	4,000	9,000	1,000	8,000	- 0.19
L.N.E.R. .. +	7,000	9,000	8,000	10,000	9,000	- 0.28
G.W.R. .. +	6,000	7,000	2,000	11,000	26,000	+ 1.50
S.R. .. +	4,000	5,000	—	1,000	4,000	+ 0.31

The gains to date of £4,400 on the Great Northern (Ireland) and of £44,872 on the Great Southern are noticeable in that the Great Northern mileage is now 19 less than in 1934 and that of the Great Southern is 34 less.

* * * *

Mr. Whitelaw on Railway Finance

How far the gratification of public curiosity regarding railway finance is actually in the public interest was discussed by Mr. William Whitelaw, Chairman of the L.N.E.R., in a speech at the British Railway Stockholders' Union luncheon last Tuesday (see news paragraph on page 216). Remarking that he was speaking only for his own company, Mr. Whitelaw considered the often demanded publication of monthly net accounts to be undesirable, since the uninformed would misconstrue such inevitable fluctuations as, for instance, those involved by fog. Still more misleading, in that they were often founded on fancy, were the optimistic reports of projected railway expenditure which appeared from time to time in the daily press. Those which forecast widespread electrification on the L.N.E.R. were quite incorrect, since such plans had definitely been rejected in the past on financial grounds. Mr. Whitelaw's use of the adjective "widespread" should be noted, for the quite unjustifiable deduction seems to have been drawn by sections of the press, that all idea of electrifying certain of the London suburban

lines has been abandoned. After the essentials of safety and maintenance to meet obsolescence had been provided for, the next class of expenditure could be described as "optional" and was directed towards increasing revenue or meeting competition. How closely this was scrutinised and planned could be deduced from the fact that the £3,000,000 so spent by the L.N.E.R. since the amalgamation had produced a return of 20 per cent.

* * * *

Overseas Railway Traffics

The Canadian Pacific Railway statement of earnings and expenses for December, 1934, shows that for that month the gross earnings increased by £158,600, but expenses advanced by £173,600, so that net earnings for the month were £15,000 lower. For the whole year 1934 the gross earnings of £25,108,600 show an increase of £2,254,600 and the net earnings of £4,876,800, an improvement of £704,400. Argentine exchange has been slightly better for the past fortnight at an average of 16.99 pesos to the £ for the past week and 17.02 for the week before that, but currency receipts have fallen except on the Buenos Ayres Great Southern, Entre Rios, and Argentine North Eastern. The Great Southern and the Entre Rios have also increases of £2,518 and £4,499 respectively, in sterling for the two weeks.

	No. of Week.	Weekly Traffics.	Increase or Decrease.	Aggregate Traffic.	Increase or Decrease.
Buenos Ayres & Pacific ..	30th	78,281	- 17,625	2,075,874	- 379,957
Buenos Ayres Great Southern ..	30th	186,875	+ 2,136	3,857,728	- 869,396
Buenos Ayres Western ..	30th	49,441	- 3,847	1,260,741	- 317,452
Central Argentine ..	30th	136,807	- 16,617	3,488,446	- 607,843
Canadian Pacific ..	3rd	391,000	- 4,000	1,047,200	- 25,400
Bombay, Baroda & Central India	42nd	193,350	+ 23,925	6,457,575	+ 300,825

* * * *

Cordoba Central Purchase Rumours

For some time past, rumours of the impending purchase by the Argentine Government of the Cordoba Central Railway, or alternatively of a working agreement between the Government and the company, have been current in Argentina. That such an arrangement is contemplated in the near future has been categorically denied by both the Government and the railway representatives; nevertheless, the belief seems to be generally held that something of the sort is impending. The latest official reference to the matter by the Board in London was made in the Chairman's speech at the annual meeting last November, when he said: "From time to time during many years we have had conversations and even negotiations on the subject, as can readily be understood, bearing in mind that the Cordoba Central is the direct line of the same gauge connecting the State lines of the north with the capital of the Republic. These talks have never come to any conclusion, and whether more recent conversations may bring results, it is impossible for me or anyone to say." Mr. H. G. Cabrett, Chairman of the Local Board of the Cordoba Central, when interviewed recently said he had no knowledge of any present negotiations. During the past fifteen years he had taken up negotiations about every two years. The Government had always been interested in acquiring the line, but the sum required for its purchase "cannot be laid hands upon in five minutes."

* * * *

Mr. McKenna on Trade

The Chairman of the Midland Bank—which will celebrate its centenary next year—has always something to say at the annual meetings which grips attention. This year Mr. McKenna dealt with the attitude of banks to industry, and with trade prospects. His statement that

banks were the servants of industry is, of course, in a measure quite true, but perhaps requires the qualification specified in his previous annual addresses than bank loans create deposits. On the monetary side Mr. McKenna saw good reason for expecting continued expansion of the nation's business. It was true that the recovery so far had been based predominantly on a broadening of the home market, but he did not believe that the limits of internal business recovery had been reached. The tariff and trade agreements were enabling our producers, while maintaining the standard of living of their workers, to secure a full share of the home market and at least some increase in exports. Other leading bankers, however, have not been so optimistic as Mr. McKenna on the prospects of international trade.

* * * *

Rail Transport in Australia

Accountancy should "present a true picture of the results of operations," says an Australian correspondent in a critical article entitled as above in this issue. He indicates by typical examples how far from achieving that object railway accountancy in Australia falls short. We are, however, doubtful if the remedies he hints at would make a vital difference under the system of bank-loan accountancy which prevails in Australia, as everywhere else today. It is probably true, as our correspondent suggests, that a re-organisation of administration might slightly improve matters; but until our whole world-prevailing financial system is revised so as to reflect real facts, no administrative modifications can make very much difference. To illustrate our meaning, consider a primitive community with no machinery, and therefore a strictly limited productive capacity, and compare it with a highly mechanised community and an almost boundless ability to produce goods with little labour. The people of the latter ought all to be immensely richer than those of the former. But we know from experience that the contrary is nearer the truth. Why? Simply because our national accountancy systems are faulty and do not "present a true picture of the results of operations." Those in charge of railway administration in Australia doubtless do their best, but their efforts are made of little avail for the very same reason that frustrates the efforts of capable administrators nearly everywhere—a system of financial accountancy which, instead of permitting people to enjoy plenty in the midst of plenty, perpetuates poverty in the midst of plenty.

* * * *

Speed and the Permanent Way

At the annual winter dinner of the Permanent Way Institution Mr. E. J. H. Lemon, Vice-President, Railway Traffic Operating and Commercial Section of the Executive Committee, London Midland & Scottish Railway, delivered a stimulating speech in proposing the toast of "The Institution." A report will be found on another page, and we would recommend it specially to any of our readers who may have been disappointed by the comparative failure of British railways to progress in the matter of speed so fast as certain railways abroad. Mr. Lemon is an unrepentant advocate of speed, which his practical experience has shown to be a saleable commodity. He foreshadowed developments in the direction of progressive speeding up in this country, as circumstances permitted it, and, in this connection, he urged all those charged with permanent way maintenance to assist to the utmost of their ability. To demand a speed restriction of 10 m.p.h. when one of 30 m.p.h. would do was to slow the traffic unnecessarily, and to add to operating expenses. Mr. Lemon's reference to the cost of speed

restrictions suggests that some sort of monetary estimate of slowing trains unnecessarily should be possible, and could be placed against the cost of equipping locomotives with a speed indicating and recording apparatus, by the use of which the permanent way engineers might be assured that the restrictions they called for should be observed. At the moment, since engine drivers have no means of ascertaining their speed, a substantial safety margin is essential.

* * * *

The Curse of Adam

Mr. Lemon, in his speech referred to above, mentioned the possible dual blessings of the results of scientific research and mechanisation in saving labour, and so lifting "the curse of Adam" from men's shoulders, and in saving money. Unfortunately, modern scientific development does not always save money, and is *therefore* deliberately retarded, the reason being that the existing system of finance-accountancy does not reflect realities. As an example, it is possible to devise permanent way requiring practically no maintenance, such as the type of concrete permanent way of which experimental lengths were laid some years ago on the Pere Marquette line in the U.S.A. Only the steel rails will wear out, and they could be renewed quite simply with little more labour than is necessary to press buttons and turn handles. In fact, a great deal of the work we do nowadays would be unnecessary if full play were given to the modern developments of applied science. The curse of Adam would then indeed be lifted, and it is at least interesting to speculate on the outcome—and why the curse is not lifted.

* * * *

A New Move in the Air

An important new step has been taken by the G.W.R. and the Southern Railway in extending their interests in internal civil aviation. Together with Whitehall Securities Corporation Limited and Mr. W. L. Thurgood, of Jersey Airways Limited, they have formed a new company, called Channel Islands Airways Limited, with a capital of £150,000, to take over the services previously operated with considerable success by Jersey Airways Limited. This company, it may be remembered, owed its origin indirectly to the formation of the London Passenger Transport Board, as when Mr. W. L. Thurgood had his outer London bus business absorbed in the merger of 1933, he reinvested his capital in the promotion of Jersey Airways Limited. The two railways hold jointly one third of the capital in the new company, while the remaining two thirds are held by Mr. W. L. Thurgood and Whitehall Securities Corporation Limited. The interesting feature of the move from the railway point of view is, however, that although Railway Air Services Limited will co-operate with the new company, the G.W.R. and the Southern Railway will hold their interest in Channel Islands Airways Limited direct and not through Railway Air Services Limited.

* * * *

Accidents to Railway Servants

During the quarter ended June 30 last, the Assistant Inspecting Officers held 31 inquiries into the more serious accidents to railway servants, of which 12 investigations related to fatal cases. For the first time since the quarter ending June, 1932, mishaps resulting in more than one death had to be investigated; in fact, the quarter under review is unusual in that three of the accidents inquired into involved double fatalities. The 31 reports were distributed among the companies as follows. The number

of fatal accidents and the deaths resulting therefrom are noted in brackets: Cheshire Lines 1; Great Western 1 (1); London & North Eastern 8 (4—5 killed); L.N.E. and L.M.S.Jt. 1; London Midland & Scottish 9 (2—3 killed); London Passenger Transport Board 1; M. & G.N.Jt. 1; Southern 9 (5—6 killed). Ten of the 15 men who lost their lives were in the permanent way department, and there was one each from the ranks of signal linemen, telegraph linemen, foreman, engineer's draughtsman, and carriage and wagon examiner. In four cases, involving the death of 5 men, there was want of care on the part of the deceased; four fatalities were due to momentary forgetfulness; two were ascribed to misadventure and two to there being no look-out man.

* * * *

Liquid Coal

The use of coal-oil mixtures, or colloidal fuel, has attractive advantages to offer a coal-producing country which finds itself under the necessity to import about eight million tons of oil per annum. Interest in this matter dates from before the war and received wide attention when, in 1932, the Cunard liner *Scythia* completed a voyage from Liverpool to New York, successfully burning 150 tons of a 40:60 coal-oil mixture in one boiler. Besides the Cunard Company, which is still engaged in this problem, the Fuel Research Board is also pursuing investigations, and last week an interesting development took place at Cardiff. Here, at the invitation of Sir Rhys Williams and the directors of Wyndham's Liquid Coal Co. Ltd., a number of engineers attended a demonstration of a new process for the manufacture of a stable mixture of finely pulverised coal and oil. This fuel is stated to be suitable for steam raising and power purposes in most current types of apparatus and can be handled and stored in the same manner as ordinary fuel oil. No stabilisers are required and the fuel is said to be stable for a minimum period of four months at normal temperatures and for much longer periods if it is stored in sealed containers. Seventy per cent. of British coals and all the well known brands of fuel oil were stated to be suitable for the manufacture of the fuel.

* * * *

American Lightweight Express Locomotives

The American railways are at present giving close attention to the lightweight high speed locomotive, designed and built for handling what are, by U.S.A. standards, light express passenger trains running on unusually fast schedules. This is an effort to maintain the steam locomotive in the front rank where speed is concerned, instead of at once thinking in terms of diesel traction for express work of an exceptional nature. One of the most interesting lightweight designs yet developed is that planned by Mr. George H. Emerson, Chief of Motive Power and Equipment of the Baltimore & Ohio Railroad. This engine is illustrated and described on pages 200 and 201 of the present issue. It has the 4-4-4 wheel arrangement, two 17½ in. by 28 in. cylinders and a boiler pressure of 350 lb. per sq. in. There are special points about the boiler apart from the high steam pressure it carries, to which of course is attributable the small size of the cylinders for a modern, and especially an American, locomotive. The boiler is of the combined fire and water-tube type and is fed by means of a mechanical stoker. The relatively low adhesion weight, 44½ tons in all, distributed over two pairs of driving wheels of 7-ft. dia., is compensated for by the fitting of a lightweight booster, in the circumstances an almost indispensable accessory. Mr. Emerson is introducing another similar engine in which the 4-6-4 wheel arrangement will be used.

Western Australia and Secession

THE case for the withdrawal of Western Australia from the Australian Commonwealth has now been set out in an official volume of 489 pages recently issued from Perth. The petition now before the Imperial Parliament in favour of this withdrawal prays that Western Australia may be restored to its former status as a separate self-governing colony in the British Empire. The Commonwealth was constituted by an Act of the Imperial Parliament dated July 6, 1900, and was inaugurated on January 1, 1901. Responsible government was granted to Western Australia in 1890, and in the ten following years the population increased from 47,000 to 179,000, the railway mileage from 188 miles to 1,355, including the lines to the distant goldfields, and the railway revenue from £414,000 to £2,800,000. During that period expenditure on development works amounted to £12,706,000—£2,144,000 from revenue and £10,562,000 from loan funds. Of this total railway construction accounted for £6,023,000 and harbour works for £1,661,000. From the time of responsible government and up to June 30, 1901, Western Australia was able to finance itself comfortably, usually completing the financial year with a surplus notwithstanding the use of revenue for purposes of capital expenditure on developmental works. The discovery of gold had no doubt an important bearing upon the prosperity of Western Australia during the period 1891-1900, but it is claimed that the enterprise engendered by self-government greatly helped to promote that development in mining which would have been impossible without the provision of proper transport facilities and an adequate water supply. Since Federation, on the contrary, Western Australia has experienced a surplus in only five years.

Western Australia's entry into Federation has been called an historical accident, her leaders having been pushed and cajoled into it by two forces of external origin, i.e., pressure from Mr. Joseph Chamberlain, when Secretary of State for the Colonies, and from the "separate or federate" movement on the goldfields. The discovery of gold had caused a great influx of population from the other Australian colonies, where the Federal sentiment had become very pronounced. In the Western Australian referendum held on July 31, 1900, there were 96,065 electors entitled to vote, but the actual numbers voting were 44,800 for federation and 19,691 against, and it was entirely owing to the goldfield's majority vote of 24,517 that federation was carried. Now, with the Federal Government at distant Canberra in virtual control, Western Australia finds herself hopelessly isolated yet bound to bear the burdens of Federal Government policy—and particularly the fiscal policy—which is said to be dictated by little or no consideration for the special needs and divergent interests of Western Australia, and which in the nature of things must be pursued primarily in the interests of the Eastern States.

Geographically Western Australia is in effect a separate unit from that constituted by the eastern States. Industrially also, her interests are quite distinct. She is dependent mainly on primary industries which have to compete in the markets of the world, whereas the other Australian States have large manufacturing interests. Before federation, when she was free to fix her own tariffs, machinery and equipment required for the agricultural, pastoral and mining industries, were in some cases subjected to a duty of 5 per cent., but were, in the main, admitted duty free, as was also the case in respect of iron and steel imports required for the general development of the country. A sum of £26,000,000 has been expended by Western Australia on its State-owned railways, largely for the purpose of providing necessary transport facilities

for primary production. More than 37 per cent. of the railway tonnage and 33 per cent. of the railway revenue is represented by the transport of wheat. Wool and mining are other export industries in which Western Australia is vitally interested, and as they have to compete in the markets of the world they cannot pass on the extra costs caused by the protective tariffs imposed by the Federal Government on the whole of Australia for the benefit of manufacturers in the eastern States.

As an instance of the additional burden on the railways of Western Australia caused by Federal tariffs, it is pointed out that in 1924 ten locomotives and 32 boilers were purchased from the North British Locomotive Company for £121,600 from State loan funds, it being impossible to obtain delivery from works in Australia in time for the forthcoming harvest traffic. The duty demanded by the Federal Government on this purchase was £32,000. Again, the cost per mile of rails and fastenings on the Donnybrook-Bridgetown line in 1898 was £730. For similar materials on the Denmark extension built in 1929 the cost per mile was £1,330. Another objection from the railway point of view is that Commonwealth arbitration tribunals have the deciding voice in questions of wages and conditions of service. Western Australia estimates that the proposed secession would enable her to earn an annual surplus of between £2,000,000 and £3,000,000 after allowing for £79,000 as her half-share of the working loss, interest and sinking fund on the Trans-Australian Railway. About one-half of this line lies in Western Australia. Its capital cost is some £6,500,000, and its loss on working for the year ended June, 1932, was £158,767, including interest and sinking fund. The capital for the construction of this railway was provided from funds obtained by the issue of Australian notes by the Commonwealth Government, but it is contended that in consequence of a recent amendment of the Commonwealth Bank Act the Commonwealth is no longer indebted to anyone for the money required to build the railway. Approximately one-third of Western Australia's public debt has been expended in advances for land settlement and development, and another third on railways. With the closer settlement and profitable production anticipated from separation it is believed that the railways of Western Australia will be made to pay. Judging from a reply given by Mr. J. H. Thomas in the British House of Commons on January 28, there is a possibility that Western Australia's petition may be considered by a Joint Select Committee of both Houses.

* * * *

The Lagny Disaster

AFTER investigations extending over twelve months, the inquiry into the causes of the disastrous collision on December 23, 1933, at Lagny, on the Eastern Railway of France, one of the worst in railway history, has been concluded. A charge of "homicide caused by want of caution" was preferred against Daubigny, driver of the Strasbourg express which ran into the rear of a train going to Nancy, wrecking it, and causing the death of some 200 persons. The court proceedings at Meaux are also now ended and judgment was pronounced on January 24, Daubigny being acquitted, as announced on page 216. As recorded in our report of the trial (see THE RAILWAY GAZETTE of January 11), charges against certain officials of the company, of which there was frequent mention at the outset, have been abandoned. The driver has stoutly maintained from the beginning that the outdoor signals were at "line clear" and numerous experiments have been made with the actual apparatus, removed to a testing station expressly for the purpose, to see if

a false "clear" indication could be produced with it, but the results were negative. In a letter published in our issue of February 16, 1934, M. Riboud, General Manager of the Eastern Railway of France, officially announced that no defect in these signals had been brought to light.

Being familiar with the circuit arrangements used for the automatic block system on this section of the line, in which the regular operation of the semaphores and discs is checked at every turn, we could not help thinking at the time of the accident that the driver had made a mistake and run past adverse signals, an impression which was strengthened by everything we read bearing on the case. That signals can be over-run in this way, the driver remaining honestly convinced that they are in his favour, is a fact of which many accidents and narrow escapes furnish ample proof in all countries. Some instances of it have never to this day been satisfactorily explained and we cannot escape the probability that the Strasbourg express, which was admittedly being driven at a high rate of speed in bad weather, ran past at least one stop and two warning signals without the driver being aware of it, with the result that the tail lights of the Nancy train were not seen until the last moment, when it was practically impossible to do anything to lessen the force of the collision. The railway company's own inquiry resulted in this conclusion. The high speed of the express is reflected in the enormous damage done to the train in front of it, which was just moving on after having been held by signal for a slow train to shunt into a siding. It seems clear, too, that the atmospheric conditions were such as to have caused the drivers of preceding trains to travel more slowly than usual. After the accident much criticism was levelled at the company in the French press, to the effect that a longer time interval should have been allowed between trains when the weather was bad, but these objections, of course, showed a complete lack of understanding of the most elementary principles of signalling.

An important factor to be considered in this case is the behaviour of the cab signalling apparatus working with the distant, or repeater, signals, and of the detonating machines used at the block semaphores. One of the latter certainly acted at the semaphore next in the rear of the Nancy train, which provides an additional reason for believing that the signal was "on," but there seems to have been a little delay in its working as the explosion of the cartridge is said to have been heard towards the rear of the train. The high speed at which the express was moving would partly account for this, as all such apparatus needs a certain time to function. There now seems no doubt whatever that the cab signal mechanism failed to act and that for some season or other it had recorded only twice on the paper band of the speed recording instrument—just after the train left Paris and once farther on. This would have tended to confirm the unfortunate driver in the belief that the signals were "off" after passing Vaires station, when in all probability he had not seen them. It is true that the company's rules state quite clearly that nothing is to take the place of direct observation of the signals, and that the cab signal equipment is merely a safety adjunct of a supplementary kind. This may be sound enough from the legal and formal point of view, but the fact remains, nevertheless, that we have to do with human beings on the footplate, and the temptation to a man who has missed a signal to rely on the cab signal apparatus, especially if it confirms him in what he subconsciously wishes to believe, is a very strong one. This is the great danger lurking behind any open-circuit mechanism of this sort, as pointed out

in an article on the closed-circuit principle in our issue for June 22, 1934, and was, we are forced to think, a contributory cause of the calamity at Lagny. Whether these defects were in any way attributable to poor maintenance, or were solely due to an exceptionally heavy frost settling on the ramps, is not clear to us, but in any case a cab signal which has no action at all on the brakes, and in which defects do not reflect themselves in delays, does not offer the same incentive to the staff to keep it in order as does one which has both these qualities. As it is impossible to prevent reliance being placed on appliances, whatever one may lay down in rules, the closed-circuit principle should be strictly adhered to for such an important function as transmitting a signal from track to train. In this respect we cannot but feel that the French railways made a mistake in their handling of this problem, though we fully recognise the great amount of effort they have devoted to it over so many years. We are under the impression, though, that they have not been entirely free to act as they wished in this respect, but that political influences were not without effect.

Much has been heard of steel carriages in connection with this accident, owing to the fact that the Nancy train was composed of old stock and was reduced to matchwood, while the Strasbourg train suffered comparatively little damage. What the accident would have been like had both trains been composed of the latest vehicles can only be conjectured. We referred to the probable results of impact between two all-steel trains in an editorial article on page 4 of our issue of January 5, 1934, indicating that the major casualties would be caused by the throwing about of their contents. These would no doubt be considerably less serious than the results of the only alternative, which is telescoping. The use of strongly built stock and up-to-date buffer and other equipment to diminish the effects of a collision is certainly a move in the right direction, and the French railways are pursuing this policy as time and money permit. But the results so to be obtained are necessarily limited to the mitigation rather than the elimination of mishaps, and must always be to some extent uncertain, so that no amount of progress in this way should be allowed to hinder activity in the primary direction of perfecting signalling and train control so as to render collisions a practical impossibility.

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The Economics of Air-Conditioning

Considered purely as a matter of expenditure and revenue, there is still a speculative element in the provision of air-conditioned rolling stock. Signs of public response to the innovation will therefore be carefully watched, and those recorded in a recent issue of our American contemporary the *Railway Mechanical Engineer* are encouraging. The introduction of air-conditioned sleeping cars on the Norfolk & Western Railroad of the U.S.A., is reported to have been followed by an increase of 14 per cent. over 1933 in the patronage of these vehicles during June, July, and August last. This was in spite of the counter attraction that an experimental reduction of fare to two cents a mile was operative in the day coaches throughout this period. Another American railway attributes to air-conditioning an increase of 20 per cent. in passenger travel during last summer. It is suggested that of even more importance than these ascertainable figures is the goodwill established between company and client. It may be that those who now desert the ordinary coaches for the air-conditioned diner, sleeper or lounge car, or who specify accommodation in air-conditioned vehicles when reserving seats, will help to restore a public which turns first to the railway for all its transport requirements.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

An Appreciation

Aguilas, Spain, January 26

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Allow me to congratulate you on the amalgamation of *The Railway Engineer* with *THE RAILWAY GAZETTE*. The very desirable effect will have been achieved of having matters of technical interest brought, in a conveniently condensed and "digestible" form, before railway executives who are sometimes unable to devote time to the perusal of several separate publications.

Wishing *THE RAILWAY GAZETTE* every success,

Yours faithfully,

GEORGE L. BOAG

The Davos-Parsenn Cable Railway

The Heath Dormy House,

Tadworth, January 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—You may remember that I wrote a letter published in your issue of May 11 last, bringing to your notice the phenomenal success which has attended the construction of the above line. The statistics of passengers carried during the year 1934, when the railway was open for traffic on 273 days, are now available. A comparison with 1933 is interesting, and reveals that although the number of passengers conveyed during the 1934 summer season fell considerably below the 1933 figure, the winter traffic increased by over 20,000 persons; and this in spite of the low rate of exchange for the pound sterling, and the restrictions placed on German travelling abroad!

The figures of passengers carried are:—

	1933	1934
Summer service ..	16,092	12,385
Winter service ..	82,687	102,965
Total ..	98,779	115,350

I myself was an interested spectator of the building of the line in the summers of 1931 and 1932, and I do not think that anyone at that time, even the promoters themselves, could have dreamt of the results that would follow. Davos has leapt at one stride into the forefront of ultra-popular Swiss ski-ing resorts, and seems likely further to develop and to prove a very serious rival to other ski-ing centres.

Höhenweg, the "halfway" station of the railway, at which a change is made from the car of the lower section to that of the upper, or *vice versa*, has been floodlit at night for the past two winter seasons. Situated some 2,000 ft. above Davos, the station is visible on the skyline from most parts of the town, and is even in daytime a conspicuous landmark on fine days. I imagine this to be the sole example of floodlighting at an altitude of 7,300 ft. above the sea.

Yours faithfully,

H. V. FISHER

Cross-Country Train Services

London, January 24

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The recent improvements you have chronicled in cross-country connections on the Continent, and your frequent references to the need for acceleration of cross-country and secondary main-line services in Great Britain, prompt me to call attention to the regrettable worsening last September of the L.M.S. Manchester and Bournemouth Pines Express, which now reaches Bournemouth West at 4.35 instead of 4.20, taking 4 hr. 25 min. from Birmingham (New Street), as compared with the pre-war time of 4 hr. 4 min. and the 4 hr. 12 min. schedule when the North and West services were remodelled and quickened in 1933. Two other expresses on the Derby and Bristol section of the Midland Division of the L.M.S. have also been slowed down in the last year—the 2.25 p.m. from Bristol (altered last May to leave at 2.20

and allowed an extra 5 minutes to Derby), and the south-bound Devonian (altered last September to leave Leeds at 10.52 instead of 11 a.m., but with the same 3.32 arrival at Bristol and no extra stops), as well as a few main-line expresses. But except in the case of the 12.10 p.m. from Glasgow (St. Enoch)—where the 9.8 arrival at St. Pancras of September, 1932, has become 9.15—the additional time allowed on the main line is chiefly the result of new stops, which have given valuable provincial services—such, for example, as the stoppage at Leicester of the 1 p.m. (now 12.55) from Leeds (now 6 minutes slower in overall timing), at Bedford of the 5.30 p.m. (now 5.35) from Sheffield (4 minutes), and at Kettering of the 5.50 p.m. from Manchester (15 minutes).

Grouping has, of course, removed the incentive to long non-stop runs on the Midland Division of the L.M.S.R., and given a welcome opportunity for the improvement of those "town to town" services which were the special province of the old Midland Railway, but it should in fairness be remembered that the improvement in locomotive power during the last year or two should warrant a little tightening up of some schedules, permitting of additional stops without extra journey time, while there are still several trains—such, for instance, as the 9 a.m. and 12 noon from St. Pancras—which afford necessary provincial services and are not covered by departures at identical hours by some shorter route, and where alteration or worsening would be most adversely criticised. There has been ample evidence in the railway press that the Midland Division schedules of 1932 and 1933 can be kept and considerably improved upon by the drivers—given a clear road—and it is now beyond question that "more time" is not always the best remedy for unpunctuality.

VIATOR

[To judge by Mr. E. J. H. Lemon's remarks at the Permanent Way Institution—see page 213—we suspect that the conditions referred to by our correspondent are probably quite temporary and may have some special reason.—
ED. R.G.]

LIGHTERAGE IN RELATION TO RAILWAYS.—Under the chairmanship of Lt.-Col. Gilbert S. Szlumper, C.B.E., Assistant General Manager, Southern Railway, Mr. C. R. East, of the Thames Steam Tug & Lighterage Company, gave a meeting of the Railway Students' Association (London School of Economics) an excellent summary of the lighterage business in the Port of London. Prefacing his paper with a brief account of the history and development of the port and its lighterage, he described the modern steel lighter as a very practical proposition if properly constructed to carry the greatest economical load combined with ease of passage through the water.

Practically all navigation nowadays is carried out with the aid of a tug, and one tug may tow six barges and no more at a time. In normal times one tug is sufficient to cover the navigational requirements of about 100 barges. In its relation to the railways, the tug company acts as agent, and inclusive rates are quoted to include lighterage, wharfage and labour at the various waterside depôts of the four main line railways. This is an inestimable benefit to the trader, who is able to calculate his transport costs to destination of the goods, and also enables the railway companies to foresee their labour and wagon requirements. The rates charged work in conjunction with the General Classification of Merchandise as adopted by the railways, and rise by stages of 10/20, 20/40 and 40/80 tons, to 80 ton lots and over. Timber forms the heaviest tonnage of traffic lightered, followed by grain and cattle foods. Down river traffic consists principally of manufactured goods. Mr. East pointed out the advantage to the railway companies of having waterside premises with substantial warehouse accommodation and direct rail connection.

PUBLICATIONS RECEIVED

The Great Western Railway Magazine, 1934. London: The Great Western Railway Company, Paddington Station, W.2. 592 pp. Illustrated. 9½ in. × 7¼ in. × 1½ in.—It is always a pleasure to receive the bound volume of the past year's issues of *The Great Western Railway Magazine*. Beautifully bound in green with the company's arms emblazoned in gold on the front cover, this annual gift from Paddington provides us with a most pleasant record of the activities for the past year of what some claim, with considerable justification, to be the most tradition-bound and yet enterprising railway system in the world. Nineteen hundred and thirty-four opened on a sad note for the Great Western, for when the year was but three days old, Viscount Churchill, who had been Chairman of the company for 25 years, died suddenly following a short illness. As in all well-organised concerns, there was no difficulty in finding a worthy successor, and the company was fortunate in being able to elect as its new Chairman Sir Robert Horne, a past Chancellor of the Exchequer. However, if 1934 had a sad beginning for the G.W.R., it at least had a happy ending with the joyous royal wedding honeymoon scenes in late November.

Transports : Rail, Route, Air, Eau. 1st Year. Nos. 1, 2, and 3. Monthly, beginning October, 1934. Paris: J. B. Baillière et Fils, 19, Rue Hautefeuille. 10¼ in. × 8¼ in. 64 pp. Illus. Price: (France) fr. 8; (Abroad) fr. 10.—An informative survey of current developments in all branches of French transport—land, sea, and air—is contained in the first three issues of this monthly journal which is well produced on art paper and profusely illustrated. Of special interest from the railway point of view are an article in the October issue, by M. Mermier, of the P.L.M. Railway, describing the efforts of French railways in 1934 to improve their services, by the extended use of railcars and in other ways (illustrated with some fine photographs of express trains in motion by M. C. F. Fenino); and another by M. Poisson, Locomotive Running Superintendent of the Nord, on safety measures as affecting the locomotive driver. The November issue describes in detail the locomotive reconstructions, both 4-6-2 and 4-8-2, of the Paris-Orleans Railway, and gives some astonishing examples of the work of these engines. December contains a lengthy article, by M. Parmentier, of the locomotive department of the P.L.M., on the modern locomotive practice of that company, and another article dealing in detail with the facilities of the port of Bordeaux. Among railway information of interest we note that it is the intention of the Nord Company this year to bring the Paris-Brussels timing of the non-stop Pullman expresses down to the even 3 hr. for

the 193·1 miles, which will involve an average start-to-stop speed of 64·4 m.p.h., including the heavier grades and service slacks necessary on the Belgian side of the frontier. All other varieties of transport receive equally comprehensive attention in this admirable monthly review.

Nigerian Affairs, 1934.—Published by the Proprietors of *The West African Review*. London: 27, Chancery Lane, W.C.2. 12¼ in. by 9¼ in. 127 pp. Illustrated. Paper cover. Price 1s. net.—On January 1, 1914, the Northern and Southern Nigerias were amalgamated under one Governor, and therefore the present number of this annual souvenir is, in effect, the coming of age issued for Nigeria as now constituted. All phases of industry and life are dealt with in a series of authoritative articles, among which is one on "what railways have done for Nigeria," from the pen of Mr. E. M. Bland, C.M.G., late General Manager, Nigerian Railways. He shows not only the part they have played in building up the present civilisation in a territory which "at the beginning of the present century was one of the few colonies . . . and its potential wealth practically unknown," but states that the railway comprises the largest investment of the country and is undoubtedly the greatest factor tending towards its economical development. It is the largest employer of labour, the greatest consumer of stores and fuel, and has done more than anything else to open up and pacify the many districts it serves.

Industrial Art Explained. By John Gloag. Illustrated by Norman Howard. London: Geo. Allen & Unwin Limited, Museum Street, W.C.1. 8 in. × 5½ in. 192 pp. Price 5s.—Mr. Gloag possesses the too rarely encountered quality of being able to write about art as if it is something that matters to others beside himself and his friends. Although he remarks at one point that nothing is quite so painful as an engineer trying to be artistic, the shaft is aimed at those who mask their aesthetic simplicity by indulging an unruly passion for ornament. Rude mechanicals who are content to accept the baseness of their attainments will find a journey to Parnassus under the escort of Mr. Gloag both profitable and entertaining.

The book opens with a short history of design in industry, excellently illustrated by sketches showing, among other things, the evolution of the railway locomotive and rolling stock. The ordinary compartment carriage is stigmatised as a somewhat unimaginative adaptation of the old stage coach "insides," with an unsymmetrically disposed corridor as the sole concession towards the mobility of passengers. Mr. Gloag considers the sleeping berth to be the greatest achievement of the railways in designing for comfort. There

is no room in a short review to refer to the many theories of design based upon the fitness of an object for its purpose, ranging from the austere doctrine that a house is a machine for living in to the saner tendencies exhibited in the best modern art. Mr. Gloag evaluates them frankly, with convincing and scientific logic.

The chapters on the present state of industrial art cover machine design, design in office equipment, and commercial art. Typography is a subject of the greatest importance in publicity work, but sprinkled with traps for the unwary. Mr. Gloag illustrates and explains the fundamental faces and their variations, good and bad, with the balanced judgment characteristic of the book as a whole. An appendix of pictures showing manifestations of the designer's art in building, furnishing, decoration and machine architecture, serves to drive home the lessons of the text.

From the pages of "Industrial Art Explained" there emerges a sense of reason and planning at work upon the creation of a more harmonious and efficient world. The influence of the artist in daily life is becoming more pronounced, and the realism with which he tackles his problems might with advantage be copied elsewhere.

Westinghouse Brake & Saxby Signal Co. Ltd., Signal Catalogue.

New sections for addition to the above catalogue are as follow: Section L, Impedance Bonds; Section N, Level Crossing Protection. Four additional pages (21-24) for Section B, Sub-section D, describe a multiple lamp type route indicator which can be read at a range of 300 yards in bright sunlight. In Section A, sub-section A, pages 35, 35a and 35b replace the existing pages 35 and 36, and as well as amending details of the type M 3 point machine, give brief particulars of a new instrument, type M 4, for trailable points. The level crossing protection apparatus in Section N includes flashing light signals, warning bells and mechanical drives for gate and barrier operation.

Fire Cement.—J. H. Sankey & Son Ltd. sends a new edition of the Pyruma Fire Cement catalogue. The material is a cement for firebricks possessing greater strength than ordinary fireclay under the rigorous conditions of temperature encountered in modern heat-generating practice. Economical furnace maintenance is assured by the properties of the cement, which not only resists cracking or crumbling, but is air- and gas-tight. Additionally, it appears to contract and expand with the firebricks under load and heat. The catalogue includes pages of useful technical data, such as tables showing Centigrade and Fahrenheit equivalents, and a temperature chart. There is a list of other fire cements for special purposes produced by the same firm, and a series of "do's and don'ts" for the application of Pyruma. Many of the illustrations and diagrams in the catalogue are in colour.

THE SCRAP HEAP

Under the heading of "Rifle Shooting—New Method of Restocking," a paragraph in *The Times* of January 21 on service rifle target shooting at Bisley remarks upon the recognised failure of the S.M.L.E. rifle to remain accurate for long. The paragraph then continues:—

There is, however, more than a possibility that the S.M.L.E. will continue to be used by a considerable number of competitors, for a method of restocking has been evolved which really does seem to make it stable. This method is the invention of Lieutenant-Colonel R. D. T. Alexander, late of the Indian State Railways, who has had many years of experience with the expansion of metal. He makes use of simple thermopiles so arranged as to apply pressure to the barrel only as it starts to heat. The great difference between this method and all others hitherto used is that the barrel is not initially stressed.

Lt.-Col. Alexander was, before his retirement in 1932, Chief Engineer and Acting Agent of the Bengal-Nagpur Railway, and his portrait and biography appeared in *THE RAILWAY GAZETTE* of May 6, 1932.

A Scotsman stood for six hours at a level crossing pulling faces at engine drivers and went home with a hundred-weight of coal!

A train which should have stopped at Queen's Road, Peckham, the other evening, went on to Peckham Rye instead. The driver seems to have had ideas beyond his station.—*From "Punch."*

Visitor to Guide: "Did I hear you say that engine had been retired? It looks quite a new one and good for years to come."

Guide: "What I meant was retired; not retired."

WEIGHTS AND MEASURES

The cause of electrification for the L.N.E.R. suburban services from Liverpool Street has found an ardent if unreflecting champion in *The Star*, which recently wound up a moving article on the subject of over-crowding with the remark: "A pint cannot be coaxed into a quart pot." We trust that we shall not be thought to presume upon our necessarily extensive technical experience if we remind our mathematical contemporary that the problem is not so formidable as it appears to suggest. Cases have been brought to our notice in which as many as two pints have been introduced into vessels of no greater capacity than that quoted, and not only introduced but subsequently imbibed therefrom with convenience and pleasure. If, then, rush hour congestion demands nothing more to solve it than the housing of a pint in a quart pot, we suggest that the London & North Eastern Railway should cease to grapple with it by the traditional

methods but confidently turn its face to the light that shines from Fleet Street and hitch its wagons to *The Star*.

SOMERS TOWN GOODS DEPOT, L.M.S.R.

We reproduce herewith a photograph, received from Mr. G. H. Loftus Allen, of an interesting Midland Railway relic which has recently been revealed by the removal of a hoarding at St. Pancras goods depot, L.M.S.R. The poster was found pasted to the brickwork of the depot, where it has remained in a remarkable state of preservation since it was affixed there nearly fifty years ago to announce the opening of the Somers Town goods station on November 1, 1887. The apparent neglect of the waste land adjoining the St. Pancras Hotel had been the source of questions from shareholders for some time, so that at the general meeting of the company on February 20, 1885, the Chairman, Mr. M. N. Thompson, announced that the site was to be used "as a potato store and market for potatoes, as a goods warehouse for outward traffic, and as a coal depot." Despite this assurance, there was a further protest at the slowness with which the scheme was being realised in the following year, but that the work involved was considerable appears from a brief account of the completed depot in *The Railway Times* of November 5, 1887. A passage of this ran as follows:—

It covers an area of 14 acres, is constructed on two floors, there being a station yard with sidings, platforms, cranes, and all necessary accommodation for working the traffic at the level of the Euston Road, and a similar yard repeated some 24 ft. above it at a level corresponding to that of the main line at the north of St. Pancras station. This upper floor is formed entirely of wrought-iron plates and girders ballasted over and supported by 450 massive columns. This structure—said to be the largest continuous iron floor in the world—has consumed upwards of 20,000 tons of iron. It has been necessarily made extremely strong on account of the heavy loads that are to come on it, for besides the weight of engines and loaded trucks, it has to bear the weight of huge warehouses and sheds with their appliances for unloading and storing all manner of goods. This new goods station is intended for an entirely new traffic, and is in addition to, but not instead of, existing accommodation.

It may be added that Mr. John Noble, the General Manager whose signature appears on the poster, was appointed on

February 17, 1880, and held office until 1892.

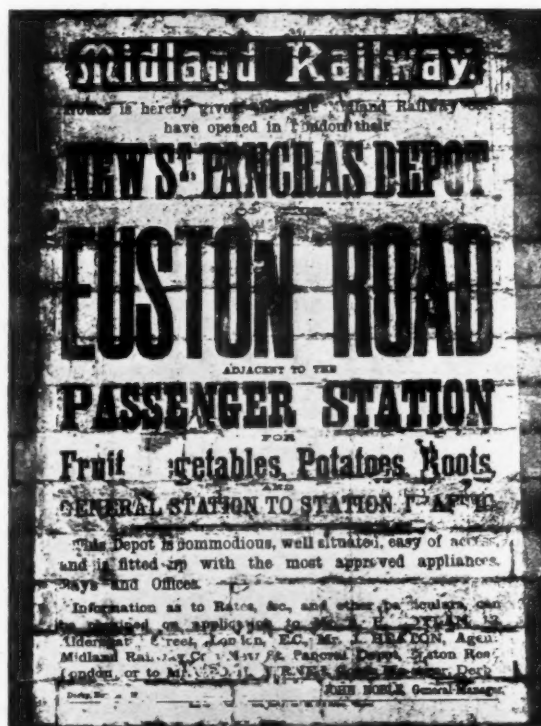
Many of the most famous trees in the world—for there can be few trees better known internationally than those in Unter den Linden—are being felled during the construction of Berlin's new north-south underground railway. The street is to be its tidy self again, however, in time for the Olympiad of 1936, for which Berlin is already preparing.

STREAMLINE

When George and Robert Stephenson
Were laying mile on mile
Of unexpected railway track
Across our lovely isle,
Their chief concern in those far days
Was "will the darned thing go":
They didn't worry much for shape
While trains ran to and fro.

To-day, with schedules hotted up
And C.M.E.'s at rest,
The Great God Streamline holds domain
And governs with a zest.
"Less Air Resistance" is his creed;
"Delete all juttings out;
Fit roller bearings; rolling stock
Must taper to a snout."

The craze runs rife throughout the land,
Remoulding engine, car,
And even fashions (streamlined ties
Are very la-di-da).
Who knows—perhaps this book of ours,
Infected by the germ,
Will cast all precedent aside
And emulate the worm.



Poster of 1887 recently uncovered on a wall at St. Pancras by the removal of a hoarding

OVERSEAS RAILWAY AFFAIRS

From our correspondents

IRELAND

Closing Broadstone Terminus

The future diversion of all traffic from Broadstone terminus, referred to in these columns on January 18, has been the cause of considerable outcry in northern Dublin. At a public meeting on that date, a resolution condemning the proposal and asking the Minister of Industry and Commerce to receive a deputation of those whose livelihood was threatened if it matured, was carried unanimously. The Lord Mayor, who was present, promised every support to the protest, and the ire of the whole of the north part of the city was duly raised and vehemently expressed.

NEW ZEALAND

Branch Railway Losses

By closing a number of non-paying branch lines the general financial position of the New Zealand railways has recently been improved. The fear that the 59-mile branch from Nelson to Glenhope would be closed—owing to operating losses averaging approximately £10,000 a year—has prompted the Nelson Progress League to start a crusade urging that loaded lorries serving the Buller (West Coast) district should be transported by railway wagon between Nelson and Glenhope. In calling upon residents to support this proposal and the railways generally, the league points out that the cost of maintaining the road from Belgrove to the Buller Valley over Spooner's Range and Hope Saddle would be enormously increased if all the heavy goods now sent by railway had to be carried in lorries over these hills, and that the bulk of the increased cost would fall, not on the lorry services, but upon the general community, in the shape of increased rates and taxes. Moreover, the Nelson Freezing Works might have to close down if the line were closed and this would be a serious matter for both the farmers and the fruit growers of the district.

The Government Railways Board has now received the support of practically every responsible local body in localities where the closing of a branch line is threatened. State ownership has much to do with this, as the direct effect on taxpayers through higher costs of road as against rail transport is more acutely felt than when private lines are involved.

In the year ended March 31, 1934, 20,138 tons of merchandise were carried on the Nelson Railway and the average length of haul was 24 miles. The revenue derived from the carriage of goods was £7,533, the average charge

per ton being 7s. 6d. and the average per ton-mile 3½d. To transport this quantity of goods, it is estimated that approximately 1,100,000 additional lorry ton-miles (weight of lorries included) running over main highways would be necessary. This will indicate what a greatly increased amount of wear and tear would be thrown on the roads if the traffic were diverted from rail to road.

The Nelson League's conclusion might well be used as a railway advertisement: "Use your railway or you will lose it. Lorry competition may cause it to be closed. Think what this will mean, a severe blow to the prosperity of your district. Even at the cost of a little more trouble and perhaps a slightly higher charge, whenever possible use your railway. You will save in rates and taxes."

Railway Value Demonstrated

In November, 1934, the Waitaki dam was completed. It is the main feature of the £2-million hydro-electric scheme, the largest of its kind in the South Island. A remarkable analysis of transport costs has now been made by Mr. R. H. Packwood, the Public Works Department's engineer in charge of the construction. The Kurow branch railway, connecting the port of Oamaru with Kurow (40 miles) was used; 80,000 tons of goods have been carried for the dam at a charge of £120,000. Some 48,000 tons of cement were carried at 2½d. a ton-mile, whereas the cost of transport by road would have been 10d. a ton-mile, and the total saving effected by using the railway amounted to £125,000. As the net cost of constructing this branch line was only £124,000, its total capital cost has been saved to the State in a direction never contemplated by its promoters; this is a specific instance of the development value of a railway.

Rentals of Railway Dwellings

A settlement of the dispute between the Amalgamated Society of Railway Servants and the Railway Department as to the rent to be charged for railway dwellings has now been effected. When the National Expenditure Adjustment Act was passed, the A.S.R.S. claimed that the statutory reductions applied to railway dwellings, but the Railway Department contended that the dwellings did not come within the scope of the Act. The society took the case to the Court of Appeal, which held that the Act applied, and suggested that there should be a settlement by negotiation, as the matter could not be simply arranged by applying a general reduction in terms of the statute.

The settlement agreed upon is a reduction of 10 per cent. in respect of

all railway dwellings as from April 1, 1933, to March 31, 1934. The excess rent paid during that period is to be refunded to the tenants at an early date, and is estimated at approximately £30,000.

There was an increase of 5 per cent. in wages on April 1 last, and the department, taking this into account, has offered a reduction in rentals of 7 per cent. as from that date, the reduction to be subject to the condition that it might in future be varied in accordance with any further general restoration of wage cuts, or of any reduction in wages.

FRANCE

Traffic Receipts for 1934 Decline

Preliminary traffic returns of the French railways for 1934 show that the total receipts in comparison with 1933 decreased by 542,095,000 fr. (£6,751,187.5 at 80 fr. to the £), or 4.74 per cent. Receipts in 1934 were in excess of those in 1933 for only four weeks during the year. For the entire year all the leading systems recorded deficits. In 1933 the decrease in comparison with 1932 was 5.96 per cent.

The receipts of the railways (in thousands of francs) in 1934, compared with 1933, are as follow:—

	1934	1933	Decrease per cent.
Alsace-			
Lorraine	750,670	771,947	2.84
Est ...	1,493,581	1,581,402	5.35
Etat ...	1,706,526	1,797,321	4.98
Nord ...	1,692,017	1,805,945	6.31
P.-O.-Midi	2,195,002	2,268,575	3.24
P.L.M. ...	2,998,620	3,153,321	4.91
Total...	10,836,416	11,378,511	4.74

Goods traffic in 1934 showed a decrease of 6.08 per cent. The total number of wagons loaded was 15,516,945, as compared with 16,523,029 in 1933.

The total net loss of the railway systems in 1934 is estimated in round figures at 4,000 million fr. (£50,000,000). This compares with a loss of 4,400 millions (£55,000,000) in 1933. The large deficit for the past year has been incurred despite legislative measures passed in 1933 and 1934 to aid the railways. In July, 1933, the passenger tax was reduced, and, as fares were maintained at the same level, this measure was equivalent to an increase of about 450 million fr. (£5,625,000) in the annual revenue of the railways. Readjustment of freight tariffs and co-operation between the railways on a commercial basis also brought additional revenue.

Railway Economies in 1934

Several additional reforms were enacted in 1934. These comprised reductions in wages and pensions, as well as plans for the co-ordination of rail and road transport, involving the closing of unprofitable lines. Wage and pension economies alone for a full year are estimated at 700 million fr.

(£8,750,000). The total economies effected by the railways from all sources in 1934 are put at 1,000 millions (£12,500,000). The co-ordination schemes effect no immediate savings, as time is required for the reorganisation, but eventually they are expected to represent an annual economy of 600 millions (£7,500,000).

Reduction of the taxes on goods transport is proposed as one means of helping the railways to reduce their losses in the near future. The suggestion is also made that the Government postal and other departments should pay for transport on a commercial basis: at present such services are free or are paid for at unreasonably low rates. Higher fares for Paris suburban passenger traffic are recommended, as this traffic, based mainly on cheap season tickets, now represents a considerable loss. Further diminution of the railway deficit depends largely upon the revival of business and the lowering of long-term interest rates, which now make the debt burden exceptionally heavy. For 1935 the charge on the national budget due to the railway debt is expected to be about 1,000 million fr. (£12,500,000).

ITALY

Funds for Accelerated Train Services

A Royal Decree published on December 28 authorises the State Railways administration to withdraw a sum of 14 million lire (£241,000 at the present rate of exchange) from the reserve fund for the purpose of "taking such measures as may be deemed necessary to assure the regularity of traffic and the safety of passengers, in view of the faster speeds at which trains will be run in future." Such measures refer principally to level crossings, which will be guarded in future on all main lines. This announcement is closely connected with the decision of the State Railways to place in service a number of the high speed trains—[described and illustrated in our issue of January 18—Ed., R.G.]—towards the end of this or early next year.

New Works at Venice

The time limit for the submission of designs for the new passenger station at Venice has been extended to March 31. The impossibility of acquiring additional land for expansion of the railway area, due to its being surrounded by canals, has necessitated the transfer of the repair shops to Mestre on the mainland. On the west side of the Maritime station a new goods yard has been built to replace the old one adjoining the passenger station. In view of the imminent demolition of the station, the ground floor of the adjoining administrative building has been arranged as a temporary passenger station, and the Post and Telegraph office is also being transferred there. The expenditure involved by the above

works has amounted to £75,000. A second group of works comprises the remodelling of the track layout, the construction of carriage washing and cleaning plants and sheds and of an emergency repair shop for light running repairs. The cost of these works amounts to £185,000. A third group of works estimated to cost £100,000 includes the construction of new departure lines and platforms. Tenders for the construction of intermediate platforms, rearrangement of sidings and sewerage works have been called for on an estimated basis of £138,500. Details are being worked out for a plant for heating the new station building and for preheating carriages, as well as for a new large electrically operated central signal-box. The total expenditure for the whole reconstruction, including the new station building, is estimated at £750,000.

BULGARIA

Traffics and Receipts

The latest full-year returns of traffics and receipts of the Bulgarian State Railways are for 1933, though some figures are also available for the first half of 1934, and are included in the "Report on Economic Conditions in Bulgaria, October, 1934," published by the Department of Overseas Trade. From this report it appears that during the former year both passengers and tonnage fell, but due, presumably, to higher tariffs, receipts increased by 364 million leva (or about £758,000, at the average rate of exchange during the past three years), as compared with 1932. Meanwhile expenditure also rose by 118 million leva (say £246,000), so that the net improvement amounted to 246 million leva or £512,000.

During the first six months of 1934, however, tonnage showed a gain, though passengers were still fewer than in the same period in 1933. Consequently receipts rose by 77 million leva (£160,000) during this period.

Construction

The original heavy construction programme for 1934 was curtailed on grounds of economy, but, even so, the following works found places in the budget.

- (1) The conversion of the Doupnitsa-Gorna Djoumayra section from narrow to standard gauge.
- (2) The completion of the Michailovo-Rakovsky line, providing a new north-to-south route from the Danube to the Constantinople direct line. (When the section down to Mastanli is completed there will also be a new through connection from the north to the neighbourhood of the Greek frontier.)
- (3) The narrow-gauge line from Tchepino is to be extended to Yakrona and Nevrokop, and
- (4) The Sofia Ceinture line is to be partly re-aligned and completed.

It will be noticed that no work is being done on the heavy Sub-Balkan line construction, which is a costly work and less remunerative in the first instance.

MANCHUKUO

State Railways

The nucleus of the State system comprised the lines of the Chinese National Railways lying in Manchuria, and amounting to about 1,885 route miles. The management of these railways, together with that of the 860-odd miles of new line built since 1931, has been vested in the South Manchuria Railway, as a convenient method of settling the liabilities and loans totalling Y.130,000,000, which Manchukuo is under an obligation to repay to the S.M.R. The properties and revenues of these lines form the securities, but the Mukden-Shanhaikwan section (formerly part of the Peiping-Mukden Railway), is under an obligation to repay various loans to the British & Chinese Corporation. The Manchukuo Government is planning to establish a Ministry of Engineering which will absorb the present Ministry of Communications, and be responsible for railways, roads, waterways, public works, and munitions.

The principal lines built by the S.M.R. for the State during the past three years are the Lafa-Harbin; Tunhwa-Tumen; Hailun-Peianchen-Chenching; Tumen-Hailin; and Tapan-Jehol. The complete railway system of Manchukuo is shown on the accompanying map; the State system now comprises 2,750 route miles and 775 miles under construction or sanctioned. In November and December, 1934, were opened to traffic the Tapan-Lingyuan; Hsinking-Talai; Peianchen-Chenching; and Tumen-Ninguto sections, totalling 430 miles. At present a State-owned bus service runs from the railheads at Lingyuan and Chenching to Jehol and Heiho respectively. The same months saw the authorisation for new lines from Solon to Hundshur, 220 km.; from Ssuningkai to Hsian, 82 km.; and from Lingkou to Mishan, 183 km. A private company has also been authorised to build a light railway from Tumen to Hunchun, close to the Chosen frontier.

Extension of Rashin Port

Among the principal works now being undertaken to extend the scope of the State Railways is the enlargement of the port of Rashin. Although situated in Chosen, this port forms the most convenient outlet for the produce of northern Manchuria, and the S.M.R. is undertaking the construction of two new piers and the modernisation of the railway between Yuki and Rashin. The S.M.R. budget for 1935-36 contains an allowance of Y.6,700,000 for this work. The operation of the lines in northern Chosen, from the border at Tumen to the ports of Rashin and Seishin, has been given to the S.M.R. in order to ensure efficient working of the traffic coming through from Manchukuo.

On the Manchukuo State Railways a new 25-arch steel bridge with concrete

BRITISH RAILWAY STATISTICS

"The Railway Gazette" monthly table of freight and Passenger traffic figures for October, 1934, as compared with the corresponding period in 1933, compiled from the Ministry of Transport Statement No. 179

Description	Great Britain*	Great Western	London & North Eastern	London Midland & Scottish	Southern
PASSENGER TRAIN TRAFFIC—					
Number of passenger journeys (excluding season-ticket holders)	99,763,218	7,277,516	14,424,944	23,097,023	17,295,573
Passenger receipts (excluding season-ticket holders)	5,355,682	259,045	654,194	863,410	707,089
Increase (+) or decrease (—)	£3,699,683	£479,749	£744,465	£1,159,281	£773,313
Season-ticket receipts	£147,216	£17,836	£31,327	£39,664	£25,138
Increase (+) or decrease (—)	£856,528	£55,891	£151,648	£237,698	£264,427
Parcels and miscellaneous traffic receipts (excluding parcels post)	£21,610	£1,082	£274	£635	£15,909
Increase (+) or decrease (—)	£1,150,845	£208,170	£335,120	£452,746	£133,020
	£34,200	£8,062	£11,544	£16,174	£3,491
FREIGHT TRAIN TRAFFIC—					
Freight traffic (tons) (excluding free-hauled)	21,852,233	5,143,880	10,084,277	9,909,094	1,303,891
Increase (+) or decrease (—)	780,239	172,004	238,835	443,891	248
Net ton-miles (excluding free-hauled)	1,199,348,469	215,625,520	410,934,496	483,745,286	54,816,109
Increase (+) or decrease (—)	34,592,109	4,863,892	10,314,206	17,008,232	1,564,018
Average length of haul (miles) (excluding free-hauled)	54.88	41.92	40.75	48.82	42.04
Freight traffic receipts	£6,936,506	£1,150,000	£2,357,000	£2,815,000	£391,236
Increase (+) or decrease (—)	£82,838	£12,255	£47,000	£13,373	£1,714
Receipts per ton-mile	1.388d.	1.28d.	1.38d.	1.40d.	1.71d.
Increase (+) or decrease (—)	0.024d.	0.01d.	0.04d.	0.03d.	0.01d.
Freight train-loads—					
Average train-load (tons)	123.55	130.65	129.47	120.14	102.60
Increase (+) or decrease (—)	0.28	1.09	1.70	0.33	1.77
Net ton-miles—					
Per train engine-hour	1,001.40	1,065.10	1,041.21	972.51	840.27
Increase (+) or decrease (—)	9.39	6.34	7.26	25.70	20.95
Per shunting-hour	843.42	758.61	920.54	879.34	563.71
Per total engine-hour	457.82	443.05	488.58	461.79	337.38
Net ton-miles per route-mile per working day	2,625	2,538	2,851	3,061	1,145
Wagon-miles—					
Total	352,943,525	61,878,917	123,431,506	147,821,030	17,479,998
Increase (+) or decrease (—)	9,412,013	1,442,866	3,474,614	4,408,024	251,514
Percentage of loaded to total	67.26	68.75	64.56	68.91	67.20
Wagons per train—					
Total	34.26	34.57	34.81	34.25	31.22
Increase (+) or decrease (—)	0.22	0.02	0.41	0.15	0.21
Loaded	23.04	23.77	22.48	23.60	20.98
Empty	11.22	10.80	12.33	10.65	10.24
Train-miles, Coaching—					
Per train-hour	15.13	14.02	14.27	14.54	17.63
Per engine-hour	12.09	11.19	11.07	11.05	14.46
Train-miles, Freight—					
Per train-hour	9.50	9.83	9.36	9.47	9.99
Per engine-hour	3.71	3.41	3.82	3.85	3.23
Engine miles, Total	45,073,590	7,047,600	12,519,718	16,723,623	5,874,783
Increase (+) or decrease (—)	1,136,645	151,421	371,303	552,175	30,252
Mileage run by engines, Total train-miles—					
Coaching	22,144,189	3,011,295	5,063,568	7,150,935	4,247,723
Freight	10,300,743	1,790,128	3,545,806	4,316,525	559,821
Engine-hours in traffic, Total	4,816,633	818,038	1,454,551	1,858,220	486,426
Increase (+) or decrease (—)	132,578	11,671	39,567	72,438	9,125
Shunting miles per 100 train-miles—					
Coaching	7.59	6.86	6.68	8.40	8.31
Freight	73.21	85.71	69.14	67.77	95.99

* All standard-gauge railways

Passenger Traffic Statistics: Number of Journeys, Receipts, and receipts per journey (excluding Season-Ticket Holders)—October, 1934

Subject	Great Britain	Great Western	London & North Eastern	London Midland & Scottish	Southern	Cheshire Lines Committee	Liverpool Overhead	London Passenger Transport Board†	Mersey
Full fares—									
Passenger journeys	31,447,818	708,081	1,172,354	1,605,075	2,676,036	21,739	155,427	24,248,090	84,828
Gross receipts	£889,439	£79,696	£125,584	£143,591	£190,175	£3,206	£1,617	£328,745	£1,523
Receipts per passenger journey	6.79d.	27.01d.	25.28d.	21.47d.	17.06d.	35.39d.	2.50d.	3.25d.	4.31d.
Reduced fares—									
Excursion and week-end—									
Passenger journeys	37,435,391	4,156,145	8,599,168	13,117,580	8,185,604	381,620	122,028	1,214,238	616,976
Gross receipts	£2,159,981	£329,478	£491,726	£814,230	£435,700	£22,269	£1,030	£25,912	£9,065
Receipts per passenger journey	13.85d.	19.03d.	13.72d.	14.90d.	12.77d.	14.00d.	2.03d.	5.12d.	3.53d.
Workmen—									
Passenger journeys	27,067,455	1,975,706	3,629,998	7,269,254	5,710,654	252,996	194,992	6,866,296	205,296
Gross receipts	£393,010	£29,153	£58,625	£116,344	£93,879	£4,372	£1,557	£75,774	£1,875
Receipts per passenger journey	3.48d.	3.54d.	3.88d.	3.84d.	3.95d.	4.15d.	1.92d.	2.65d.	2.19d.
Other descriptions—									
Passenger journeys	3,802,524	435,056	1,021,000	1,101,038	722,393	48,240	1,051	393,489	11,253
Gross receipts	£243,960	£37,995	£65,460	£79,350	£52,648	£2,773	£5	£3,372	£130
Receipts per passenger journey	15.40d.	20.96d.	15.39d.	17.30d.	17.49d.	13.80d.	1.14d.	2.06d.	2.77d.
Total—									
Passenger journeys	99,763,218	7,277,516	14,424,944	23,097,023	17,295,573	704,675	473,498	32,722,113	918,355
Gross receipts	£3,699,683	£479,749	£744,465	£1,159,281	£773,313	£32,701	£4,209	£433,803	£12,595
Receipts per passenger journey	8.90d.	15.82d.	12.39d.	12.05d.	10.73d.	11.14d.	2.13d.	3.18d.	3.29d.

† Includes passengers originating on the railway undertakings, and on the Whitechapel and Bow Joint Railway

IMPRESSIONS OF OVERSEAS TRANSPORT

X.—Transport at the Chicago World's Fair, 1934

By A. W. ARTHURTON, formerly Secretary, British Railways Press Bureau

THE Chicago World's Fair of 1934 was unique by reason of its financial success, since its guarantors received their money back with interest. This was in spite of being its second year of life. The exhibition grounds, $3\frac{1}{2}$ miles in length, were on land recovered from Lake Michigan, and they add to the many miles of Chicago lake front, lined with sandy beaches and beautiful drives. Chicago is a city of striking architecture, of skyscrapers and beautiful buildings. Situated at the crossroads of the country's travel and commerce, it is fortunate as regards travel facilities as it is the meeting point of many railways, radiating in every direction. It was upon the enterprise of these railways that there depended the provision of swift and comfortable transport for the many millions of visitors to the World's Fair.

We arrived at Chicago on the day prior to the closing of the New World's Fair, 1934, and were fortunate enough to see some of the final scenes. They were striking enough even for the United States—the country of big things. More than 370,000 people attended the fair on the last day, and although the grounds were of great length they were uncomfortably crowded towards the evening. A rough element was in evidence, and, knowing the reputation of Chicago's underworld, which, by the way, seems to be much exaggerated, it was a little surprising to learn from the papers next morning that no shootings took place, although some very unruly scenes, in which a considerable amount of wrecking occurred, were enacted. The only deaths recorded were three in a street row.

Americans love fireworks, and I have always been surprised at the number of deaths which take place each year on July 4 (Independence Day), when they let themselves go as well as the fireworks. The display of fireworks with which the exhibition ended at midnight on October 31 was worthy of the occasion. Sitting at our bedroom window in the Steven's Hotel on Michigan Avenue, which faced the exhibition grounds, we were both able to see and hear the display in comfort. It was a wonderful sight, and for brilliance, noise and variety excelled even Brooks' Benefit Nights at the Crystal Palace.

Railways at the Fair

Within the grounds, convenient and comfortable transportation included a regular bus service and sightseeing buses, rickshaws and push chairs, also fleets of gondolas, speed boats and other craft on the lagoon. Street cars, elevated trains, motor coaches and taxis provided an adequate service from the various railway stations direct to any gate of the fair quickly and with a minimum of effort and expense. The Central station of the Illinois Central Railroad was the nearest of the main line terminals to the exhibition main gates, and the electric trains from Randolph Street, Van Buren Street and Roosevelt Road served all the entrances. Chicago is well supplied with terminals of all the large railways, among which may be mentioned Union, La Salle Street and Dearborn stations, Grand Central terminal and the Chicago North Western station. Once inside the exhibition, the bus service in and around the grounds was most convenient and provided an excellent means of getting from one part of the fair to another.

Each of the great railways exhibited varied features of its service and equipment, such as *de luxe* passenger cars accompanied by cinema shows, enquiry bureaux and so on. I was, however, surprised to find no example of the latest type of steam locomotive (and the *Royal Scot* was of course absent) although the very latest electric locomotive and the diesel-engined Burlington Zephyr were on view. This was to my mind rather significant in view of the competition between steam and oil as a motive power. There was, however, a full sized copy of the *John Stevens*, the first locomotive to run in America in 1825.

A powerful electric locomotive was exhibited by the Chicago, Milwaukee & St. Paul company. This huge machine, 76 ft. in length and of 3,200 h.p., has with three others been six years in service. The same system, which has 61 electric locomotives altogether, also exhibited the Progress Coach, a forerunner of 50 similar cars now under construction at Milwaukee and representing by its lightweight construction a new departure in American railway equipment. The coach marks a complete break with tradition. It is streamlined, embodies new materials and new principles of construction, weighs only two-thirds as much as a standard coach, and, most important of all, was built entirely with the passenger's viewpoint in mind. The amount of room on the car, the extra width in the aisles, the wide spacing of the seats and the commodious smoking rooms are immediately noticeable. The car is 5 in. wider than the conventional coach, yet seats only two-thirds the usual number of passengers, consequently there is more than 10 sq. ft. of floor space for each passenger as against $6\frac{1}{2}$ sq. ft. in standard coaches. By the use of special alloys, all-welded construction in place of riveting, and changes in design, the weight of the car has been reduced to 25 tons less than the standard coach, without any loss of strength. With its fine record of leadership in pioneering such railroad achievements as silent roller bearings, coil-spring mattresses, observation cars and electric power for operating transcontinental trains, it is appropriate that the Milwaukee company should be the first to present the new type of lightweight equipment exemplified by the Progress Coach.

In addition to these railway exhibits there was the original Pullman car of 1859, and it was interesting to compare this with the latest type of car also exhibited. The primitive sleeping berths and the circular wood-fired heating stove at the end of the car brought home to one very vividly the comfort and convenience which characterise modern railway sleeping coaches. Early stage coaches and modern cars and coaches showed the progress in highway travel, while the air liner exhibited by the United Air Lines of America typified the newest form of transport.

Nearby the Travel and Transport Building was a wonderful transport pageant, "The Wings of a Century," given daily in a huge open air theatre, where could be witnessed a procession of Indian travois and the creaky lumbering wagons of a century ago, stage coaches, post-chaises, Conestogas and other forms of freight wagons, prairie schooners and the like. In the later development of the pageant the broad stage became the pathway of recent kinds of transport, leading up to the most modern railway equipment.

PIONEER WORK IN RAILWAY SAFETY

I—Safety of single lines of railway

THE saying we have so often used in connection with our remarkable railway accident record, that "the greater the danger, the greater the safety," is particularly applicable to the working of single lines. Although, from the beginning of railways, it has been usual in this country to construct them as double lines, mainly because it was considered safer, there were many single track railways built. The early attitude towards single lines may be judged by the fact that, of certain railways authorised in the middle 'forties, it was agreed that the track should be single, but all the works were to be for a double line, and that when the gross receipts for three consecutive years exceeded a certain sum, the line was to be converted from single to double line. Despite the many single lines in use, it was not until August 27, 1860, that a passenger was killed in a collision on one of them—due to a telegram telling the driver of a goods train to "pass Onibury," instead of to "pass at Onibury," a special passenger train. Not for another fourteen years was there a fatal collision on a single line. Then, on September 10, 1874, there occurred the terrible collision, $1\frac{1}{2}$ miles east of Thorpe station, Norwich, Great Eastern Railway, when the mail from Yarmouth met, head-on, an express from London. Twenty-one passengers and all four enginemen were killed.

The method of working was simply a timetable, varied only by telegraphic instructions. Every train running on a single line had to have a "starting order" which authorised the driver to take the train to a certain station, where he was to pass another—specified—train. The mail, in this case, had the priority, as the express was late and the inspector at Norwich told the telegraph clerk to instruct the staff at Brundall to send on the mail. The inspector afterwards changed his mind and despatched the express, on the assumption that, because he had not signed the telegraphic order, it would not have been transmitted. It had gone, however, and disaster followed. On August 7, 1876, gross negligence at two stations led to a special train from Bath meeting, head-on, a relief passenger train from Bournemouth between Wellow and Radstock stations on the Somerset & Dorset Joint Railway. Twelve passengers and a guard were killed. In Ireland, between Antrim and Dunadry, on December 26, 1876, a passenger train met a special goods train, the running of which had been forgotten, and one passenger was killed.

No Accident for Forty-four Years

While the record of only four fatal collisions on single lines up to the end of 1876 was remarkable, more wonderful results were to follow, as despite the increased mileage opened for traffic—much of which was single track—and despite also the greater number of passengers carried, not only was there not another fatal collision for forty-four years, but there was only one collision of any sort involving a passenger train which had to be inquired into by the Board of Trade during that period of nearly half-a-century. The fatal case was at Abermule, on the Cambrian Railway, on January 26, 1921, and was due to failures of the human agent.

The recent sixtieth anniversary of the Norwich collision makes it appropriate to pay tribute to the man—the late Edward Tyer—to whom the remarkable safety of single lines is due. When barely 22 years of age he invented a

cab-signal, protecting it by patent 13906 of January 22, 1852, and, two years later, by patent 52 of January 10, 1854, extended it, under the eighth claim in his specification, to automatic train control. In this and in other respects, that patent anticipated an essential in all the early American patents for automatic signalling, in that it protected the use of rail-contacts. Outside his work as a maker of electrical instruments for railways—wherein he was the founder of Tyer & Co. Ltd., of Dalston—he did much good public work with electric telegraphs. According to his obituary notice in *The Times* of December 28, 1912, there was, prior to 1859, no telegraphic intercommunication within the London area; the trunk lines and cables came into London but were not connected to each other, and, furthermore, communication by telegraph was possible only from the main offices of the various telegraph companies. Tyer evolved a plan for joining up the various electric lines and for establishing subsidiary offices. The London District Telegraph Company was formed in January, 1859, of which he became the electrical engineer. On completion of that work Tyer began to devote all his energies to railway instruments and the development of telegraphs was left mainly to Mr. W. H.—later Sir William—Preece.

Introduction of the Electric Tablet System

At the time of the Norwich and Radstock accidents, the means usually employed—but not at either of those places—for controlling the movements of trains on single lines was the staff-and-ticket system, supplemented by the block. Tyer's idea was a combination of the two, but with a definite control by each of the men concerned in the working of a section over the other's actions. That control, moreover, could be exercised from either end, and no longer could a section be entered only from the end holding the train-staff. Tyer's patent was No. 1262 of March 30, 1878. It is significant that what became known as tablets were then referred to as staff-discs. Each of the two boxes that controlled a single line section had an issuing instrument and a receiving instrument. The latter had an upper lid, which was raised when a tablet, brought by a train from the other end of the section, had to be inserted. There was also a lower lid inside the machine, and the two lids were so interlocked that the lower had to be in position to catch the tablet when inserted through the upper lid. On the latter being shut the lower lid was released and the weight of the tablet tilted it so that the tablet fell into a bag in the lower part of the instrument, the key of which was kept by the lineman, who emptied the bag from time to time and put the tablets into the issuing instrument. A counterweight on the lower lid restored it to position, and put the receiving instrument again into phase with the issuing instrument at the other end of the section. The tablets were kept in a cylinder in the issuing instrument, at the base of which was a slide, with a recess of the exact depth and circumference of a tablet. The slide was electrically released from the box in advance and the release remained effective against the issue of another tablet from either end. It is not without interest, in view of the developments after the Abermule accident of 1921, to hear that whilst the body of Tyer's specification mentioned the control of signals by the tablet, that feature was not included in his claims. The initial experiments under working conditions were made on the Cockermouth, Keswick & Penrith Railway. The trials began on October

9, 1879, and, proving satisfactory, the instruments were withdrawn for overhauling and then put into permanent service in August, 1880, after inspection by Major Marindin on behalf of the Board of Trade. They were next used in the same year on the Morningside branch of the Caledonian, and between 1880 and 1882 they were introduced in instalments on the Callander & Oban Railway from the terminus to the junction with the main line at Dunblane.

The first leading railway to use the tablet was the Midland, in 1888, between Staveley and Elmtun and Cresswell, and, in due time, it was adopted by all the Scottish railways and by all the English except the London & North Western and the Great Western, which companies used the electrical train staff, invented, in 1889, by Messrs. F. W. Webb and A. M. Thompson, of the L.N.W.R. The first use of the electric staff on the

L.N.W.R. was between Bedford and Sandy in 1889 and on the Great Western between Dawlish and Parson's Tunnel box in 1891. The electric train staff patent was No. 1263 of 1889. It is significant that the specification opened by observing "There are two well-known systems on which the traffic on single lines of railway is regulated, the staff system and the tablet system." After remarking that the latter was fully described in Edward Tyer's specification No. 1262 of 1878, it said "the object of our invention is to provide a simple form of apparatus whereby the use of the staff may be retained." In their basic idea—the provision of electrically-controlled means for ensuring that only one train should be in a single line section at the same time—and in other directions the patentees admitted that they had been anticipated by Tyer, and until the Tyer patent expired they paid a royalty on each staff instrument made.

RAIL TRANSPORT IN AUSTRALIA

A critical survey of Australian railway administration

(From an Australian correspondent)

THE Australian Year Book states that transportation was abolished in the Australian States about 1840.

That is hardly correct. What is there referred to is exile. Transportation is a very live industry in Australia. Australian transport has no literature. The only two books on railways have been written with limited objectives and are really official publications.

The first settlement in Australia was at Sydney, New South Wales, in 1788. Then a village sprang up at Parramatta, about 14 miles away. A road was built between these two centres, and sixty-two years later it was with the object of connecting these same points by rail that the first sod of an Australian railway was turned, in 1850, when the population of Australia was only 238,000. About 1813 the explorers Wentworth, Lawson and Blaxland discovered a passage over the Blue Mountains (N.S.W.). Some years later a road over these mountains was surveyed, and built by convict labour. The main western railway of New South Wales now follows that route.

From 1788 till after 1820 New South Wales comprised practically the whole of Australia. By 1859 (first railway opened September 26, 1855, from Sydney to Parramatta), Australia had been divided into the present States (six), the total population being then 668,000, and at this stage the State Governments, being convinced of the great value of the railway in the absence of navigable inland rivers, had to take over several railways which private enterprise had begun but could not finish. Private enterprise had been responsible for the commencement of two railways in New South Wales, at Sydney and Newcastle. The Government purchased large blocks of shares and contracts were let for construction, which was never completed by the companies because of the difficulties encountered. Suitable labour was hard to obtain owing to large numbers of men rushing to the newly discovered goldfields, and the shortness of money was a still more serious obstacle. In Victoria a company built the first 2½ miles of line and after that the Government took over the building and ownership of railways. In all the other States the railways were Government undertakings from the start. Therefore, from necessity, the provision of railways devolved upon the State Governments, and out of this situation gradually emerged three features quite peculiar to Australian railways, namely, (1) three big networks of different gauge, (2) State ownership and operation, (3) the entire financing

of the railways by Government loans which form part (almost half) of the national debt.

In each State for many years the railway administration was simply a government department. This form of control lent itself to undue political influence and at a later stage (1889 in N.S.W.) the railways were vested in commissioners who became "corporate bodies," but their finances were not at the same time separated from those of the State. The governments retain to this day control over rates and fares, by-laws and regulations, and the parliaments still authorise and finance all extensions of the railway systems, the actual construction being usually carried out in the past not by the Railway Commissioners but by the Public Works Department. Estimates of cost, working expenses and revenue for proposed lines were always framed by the Railway Commissioners, but in a number of cases the parliaments have paid no heed to the estimates and warnings of railway experts. It has been quite common for estimates of cost to be exceeded, and this was not always due to the technique of construction but sometimes to the methods of financing the projects.

Railways have not been promoted by the Railway Commissioners or by the future owners but by local councillors, aldermen, progress associations or railway leagues, who became enthusiastic for the building of railways without having the smallest direct stake in the venture. Naturally railways thrived under such encouragement. The methods of financing and carrying out extensions were conducive to utter irresponsibility in regard to the success of new lines and in some cases the very reasons for which lines were promoted have been lost sight of or have even partly disappeared before the section was open for traffic.

Organisation

The success of any business is dependent on good organisation, hitherto a somewhat neglected science in Australia. Victoria is to-day evolving a divisional scheme under the régime of Mr. Harold W. Clapp, Chairman of the Board of Commissioners, but even in this State the channel of communication is the Secretary and the organisation has certain defects. In the actual administration of railways, we find still greater defects. Throughout Great Britain, the United States and Canada the company type of organisation at headquarters has been adopted, and so partly has the divisional system of management. As to

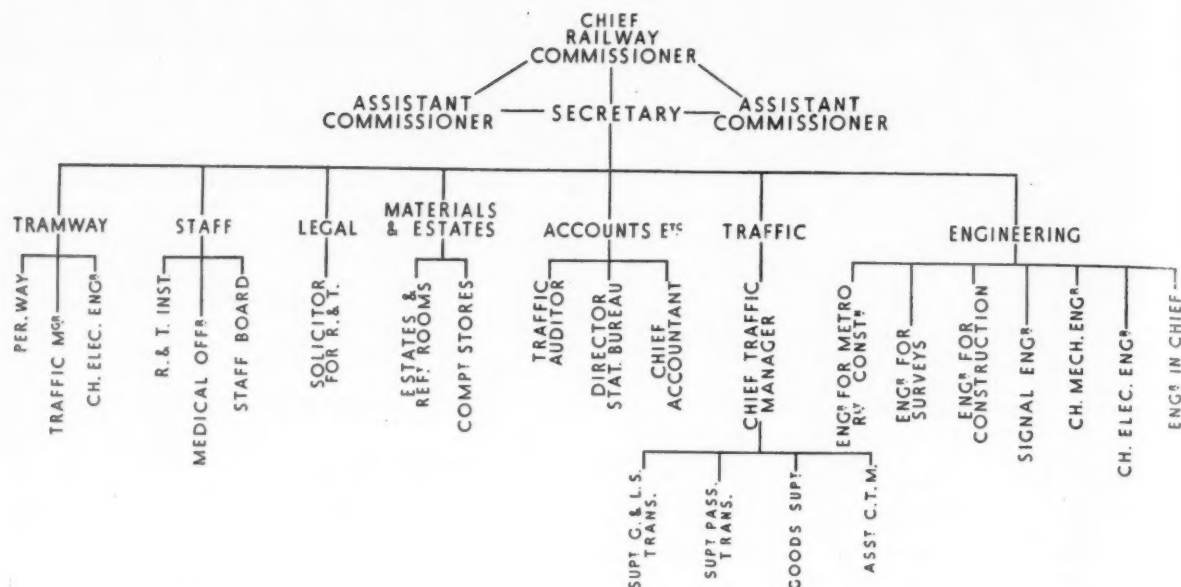


Fig. 1—1924 organisation, New South Wales Government Railways and Tramways

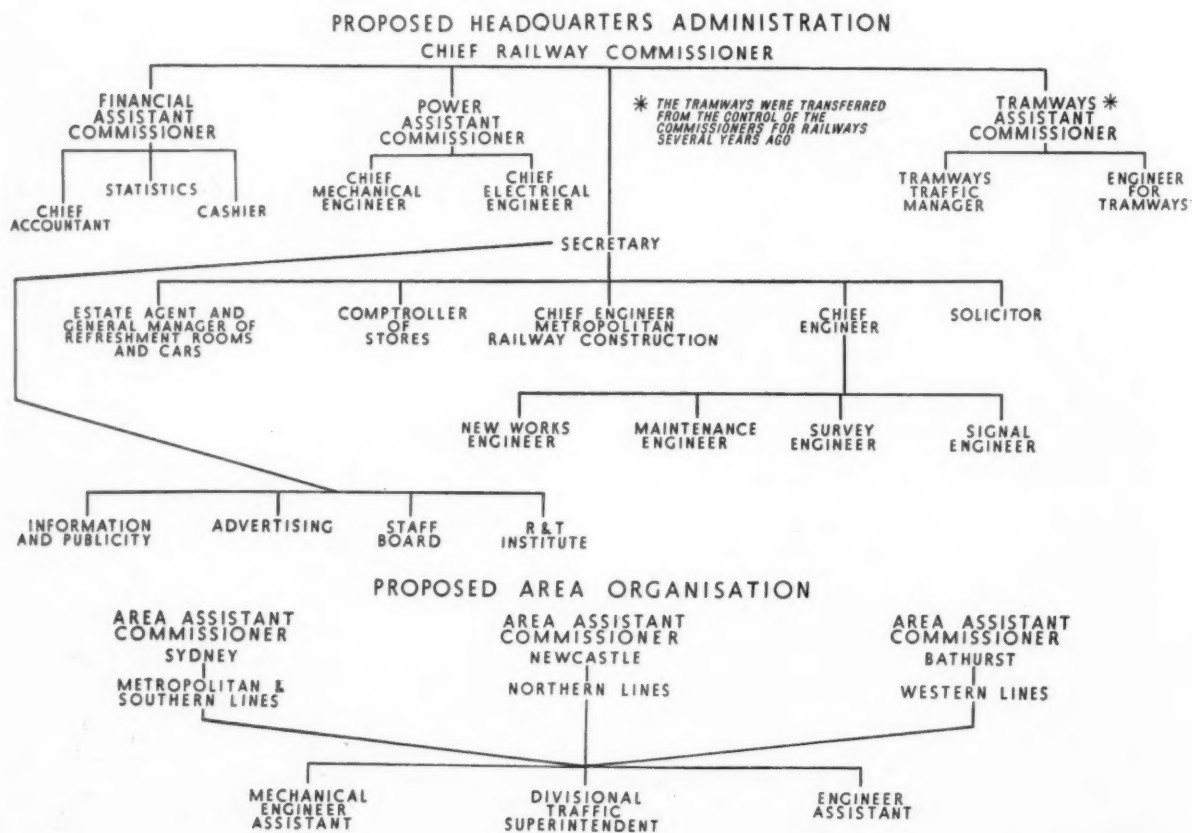


Fig. 2—Scheme of organisation recommended by the Royal Commission in 1924

Australia, the headquarters organisation in New South Wales may be taken as roughly typical. The Secretary, whose status is the same as the head of a department (*e.g.*, a Chief Mechanical Engineer) is virtually the permanent chief of the Railway Department because the commissioners, past and present, have been appointed for seven years only. With a change of Government there is always likely to be change of commissioners, such as New South Wales has experienced in recent years. The commissioners (usually two or three in each State) are equivalent to the British or American directorate. In the latter countries there are usually presidents and vice-presidents (or general managers and assistants) and these officers form the permanent heads, but in Australia the Secretary, being the channel of communication between commissioners and heads of departments, fulfils that function himself.

The organisation of the executive varies somewhat from state to state. In New South Wales there is the old departmental scheme slightly modified; in Victoria the divisional type is being developed; in Queensland the divisional type was forced on the administration owing to there being several isolated railway networks. In South Australia and Western Australia the plan is largely departmental.

About 1924 the Government of New South Wales appointed a Royal Commission with the late Sir Vincent Raven and Sir Sam Fay, two representative English railway officers, to investigate the operation of the New South Wales Railways. This commission saw at once the serious defects of the existing organisation and recommended a drastic change. Nothing was done, however, and the old organisation still persists. Charts of the old scheme and that recommended by the Royal Commission in New South Wales are shown opposite.

As already mentioned, the entire capital invested in the Government railways of Australia is general loan money upon which moderately high rates of interest and exchange must be paid. On the other hand the railways have paid very little for land, are free from ordinary taxation and largely free from local government rates.

Each State owns and operates its railways. For many years regular conferences between heads of departments and between the commissioners of the various States have taken place with the object of securing as far as possible uniformity of technique and practice. Good results have been achieved. The commissioners' conferences give decisions on the recommendations of the officers' conferences and on matters arising at their own meetings. The decisions are not binding on each State but most of the agreements have been honoured.

While the leading railway engineers have had many conferences, little has been accomplished in such fields as rolling stock and permanent way standardisation, and this is one of the arguments used in moving the Commonwealth Government to consider ways and means of achieving a greater measure of co-operation and uniform practice. The Engineering Standards Association has hardly touched the specialised field of railway engineering.

Sydney Harbour Bridge Finance

Something has already been said about the absence of what might be termed continuity in planning and carrying out railway policy and management. To take a concrete example of unachieved purposes, there is the outstanding case of the Sydney Harbour bridge, an enterprise which has cost nearly £10,000,000 (including surplus land). The city of Sydney is divided by Port Jackson, and for many decades the ferry boats of private companies used to carry people and vehicles across the quarter-mile of water. For half a century tunnel and bridge connections for railway, tramway and road traffic were discussed, and finally an

Act was passed authorising a bridge and the method of financing it. The Railway Commissioners were to find two-thirds of the cost and the remaining third was to come from a special property rate in the northern suburbs. At that time the tramways were vested in and run by the Railway Commissioners. A Public Works Department was charged with the task of making recommendations as to design and construction of the bridge and drew up the specifications after conferring with the Railway Department (including tramways). In 1925 a contract was let to Dorman, Long & Co. Ltd. for the construction of an arch bridge across the harbour, with provision for four railway tracks, a broad roadway and two footways. The bridge was to be part of a scheme of electrification of suburban railways, extension of those railways into and through the heart of the city and an extension (15 or 20 miles) on the northern side of the harbour to Manly, Newport, &c. The northern side extension has not so far been carried out. The electrification was finished and the city railway extension was opened for traffic before the bridge was opened in March, 1932. Since 1930, with the exception of a period of a few months, the tramways have been under the control of a separate department.

As the Railway Department was to contribute two-thirds of the cost it was generally understood that the bridge would be controlled by that department after it was built. The Act did not define how the bridge should be used and controlled and these phases seem to have been no one's particular concern. Just before the bridge was opened in 1932 an Act was passed vesting the bridge in the newly appointed Transport Commissioners, and within twelve months the bridge was re-vested in the present Commissioner for Main Roads. The bridge and approaches cost much more than was anticipated and the railway extension on the northern side was not carried out. It therefore became plain that the additional railway revenue and the promised income from the councils would not cover all charges, and it was decided to introduce a toll and to concede a strong claim put forward that, at all events temporarily, trams to and from the north side should be allowed to use the bridge. Even now the toll, railway and tramway revenue leaves a deficit each year.

The only use made of the bridge by the railways is for suburban passenger traffic. Long distance passenger traffic and both local and long distance goods traffic are neglected, although such use of the bridge was contemplated. Through the night for many hours the four railway tracks on the bridge stand silent and idle except for the hourly passing of an all-night tram.

Australian Railway Accountancy

The prime purpose of accountancy is to present a true picture of the results of operations. As appropriate to such undertakings, the State railways have adopted the double-account principle, but have not modernised their accounts to accord with the best practice. New South Wales is the only State to show a capital account separate from the balance sheet, yet this has for many years been a widely accepted procedure. Victoria publishes a general balance sheet with no separate capital account and has adopted a confused method of dealing with rolling stock depreciation and renewal. The Victorian annual report for 1933 shows that under the working expenses classification of rolling stock, £100,000 were charged for depreciation and writings off, while in the balance sheet the rolling stock renewal fund shows a balance of only £11,938 and the credits to loan funds under the heading of rolling stock as £123,316. It is usual in Australia to debit in the case of a complete renewal (*e.g.*, an engine) the whole cost of the new unit to capital then to debit the original capital cost to working expenses and credit capital

account with a similar sum, but it is impossible to see from the annual accounts just what amount has been involved in this way because it is shown together with other capital credits. South Australia shows as an asset in the balance sheet the following item: "Depreciation existing rolling stock to June 30, 1927, written off £3,088,985," when apparently what is intended is: "Depreciation to be written off." These instances are given to indicate the general ambiguity of the accounts and the need for adopting the commonly accepted rules of the double-account system. The terminology too is incorrect, e.g. the terms "depreciation" and "renewals" in the Victorian accounts are not consistent with the double-account scheme.

Few subjects have received more prominence in Australia of late than railway depreciation, and few subjects have given rise to so much confused discussion. Railway accountants know just what has been and is being done, but no one else is able to ascertain this from railway accounts. It is claimed by railway administrations that very inadequate provision has been made for depreciation and the Government and the people support the claim. The double-account plan does not provide for a depreciation account and because of this most people accept the straw-splitting statement of some officials that no depreciation has been provided for.

Road Motor Competition

The railways commenced to feel the effects of motor competition about 1925. The old monopolistic spirit was strong and the railway managements turned to their respective Governments with appeals for restrictions upon road activities, without waiting to put their own house in order. Losses there were, and the motors were allowed privileges denied the railways, but the results of competition were over-emphasised. As time went on and road surfaces were vastly improved by Government expenditure, the position became much more serious. With big railway deficits looming up, the State Governments found it difficult to plan the balancing of their budgets, of which the railway revenue and expenditure formed part. Apart from the general depression, each State railway system was losing hundreds of thousands of pounds to road transport, which was operating with perfect freedom on roads paid for largely by general taxation. Queensland and South Australia were perhaps the first States to tighten appreciably the taxation and regulation of commercial motor vehicles. In these two States regulation took the form of prohibited routes, i.e. commercial vehicles (passenger and goods) were prevented from operating on routes directly competitive with the State railways. In 1931 the New South Wales Government (Labour) passed a co-ordination act by which all services competitive with the railways for more than a small minimum distance (20 miles for goods) were subject to a maximum tax of 3d. per capacity gross ton mile in the case of goods and 1d. per passenger mile in the case of passengers. The result of this was that most operators had to leave the roads. Victoria recently concluded legislation for the restriction of motor competition, and when West Australia finalises the bill now in hand there will be up-to-date legislation in each State of the Commonwealth for the stricter regulation of road motor commercial services.

One generally recognised weapon of defence the railway has against road operators is the adoption of small units of transportation, such as the railcar, but in Australia development in this direction has been slow. People in the country have for many years been requesting the railway departments to provide railcar services, but few have been given except in Queensland. Victoria has some petrol-electric cars but the railcars in the other States are simply petrol cars with mechanical drive. New South

Wales has just completed one with torque converter drive. The opportunities for the railcar are great in a country like Australia.

Each State has its suburban railway service which is part of the State railway undertaking, and in Victoria and New South Wales road motor competition has been combated to some extent by electrification of these services. The route miles electrified in Victoria are 173 and in New South Wales 91. The Victorian conversion took place over a period of about ten years and was rather wisely planned as part of a renewal programme, whereas in New South Wales the electrification was effected in a much shorter time (about five years). It, too, was associated with a renewal programme, but mainly it formed part of the city underground railway scheme (new lines) with connection between Sydney and North Sydney by means of the Sydney Harbour bridge. The New South Wales electrification was not nearly so well planned financially as the Victorian work, and the big additions to the capital invested in the New South Wales railways have played no small part in the deficits of recent years.

Rates of Pay and Staff

Australia has committed itself to the judicial system of fixing rates of pay. State and Federal Arbitration Courts have been set up for the purpose of fixing the basic wage, and making craft awards after hearing evidence from both sides. Before the court will hear an application for an award it must be satisfied that a dispute exists and that the body making the application is a properly registered trade union. The courts usually go no further than fixing the pay attached to classifications. The administrations are then free to apply the classification and select the man for the job. Special appeal tribunals or courts have been set up to hear appeals against punishment, but the commissioners may vary or ignore the decision of the Appeals Board.

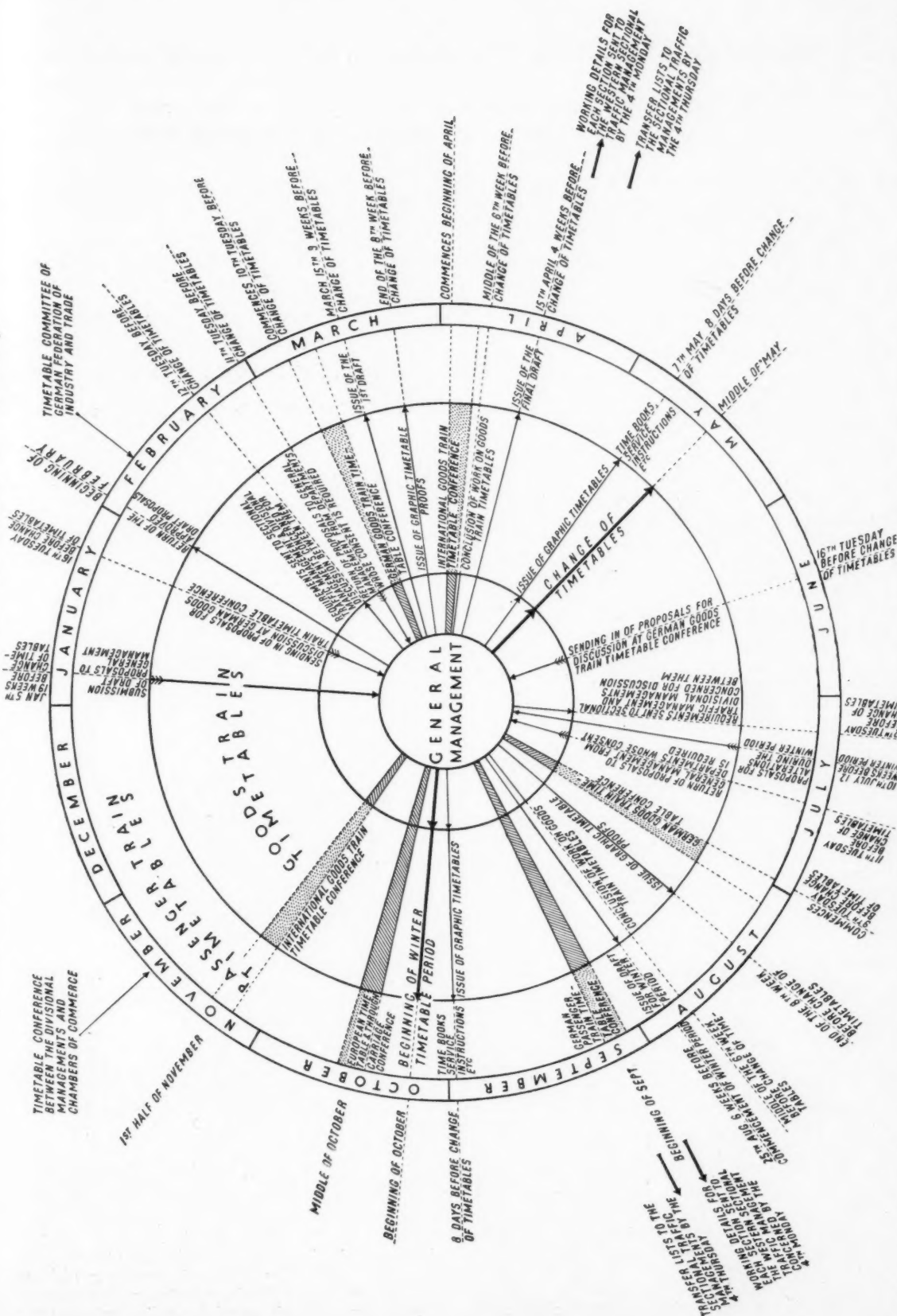
The judicial method of fixing rates of pay has cost the country a great deal, because most of the judges are poor transport or commercial men. At the same time it must not be thought that all Governments and commissioners are afraid of reducing wages: reductions have taken place in the last few years, Federal rates of pay being reduced by 10 per cent. and New South Wales rates on a sliding scale ranging up to 33 per cent. on salaries of £1,500. In Victoria there have been appreciable reductions and, although Queensland has enjoyed almost continuous Labour Governments, the wages were reduced there also. Awards of the court are usually made for three years.

A fact that has caused much trouble is that some railway employees are governed by awards of State courts while others come under Commonwealth court awards. This has given rise to considerable dissatisfaction, particularly in relation to what constitutes a week's work, e.g., one man paid under a State award for a 48-hour week may be working alongside a man in the same trade working a 44-hour week under a Commonwealth award. It is hoped to rectify this at an early date. The rate at which expenditure has been reduced lately has been largely influenced by lower rates of pay. The Railway Commissioners have power to retrench, but usually retrenched men receive a pension or a gratuity.

Labour represents something like 70 per cent. of working expenses, and the railway administrations have little direct control over rates of pay. In New South Wales the industrial court or commission has even claimed the right to determine individual cases brought before it. From these comments it will be seen that men and management have lost contact over the vital issue of pay and hours.

(See editorial comment on page 182)

Preparing Local and International Timetables in Germany



The cycle of procedure and departmental co-operation involved in the preparation and issue of passenger and goods timetables for the German State Railway is graphically represented in the above diagram used by Dr. Ing. Leibbrand to illustrate a recent lecture, now published in pamphlet form

NEW HIGH-SPEED LOCOMOTIVES, BALTIMORE AND OHIO RAILROAD

This design incorporates the 4-4-4 wheel arrangement in conjunction with 7 ft. 0 in. dia. coupled wheels and a special type of boiler

DURING the latter part of last year the Baltimore & Ohio Railroad Company completed at its Mount Clare shops, Baltimore, the first of two lightweight passenger locomotives especially intended for high-speed service; the second engine, which has the 4-6-4 wheel arrangement, will, it is anticipated, be placed in service during the present month.

In THE RAILWAY GAZETTE of November 30, 1934, there appeared an illustration of the engine now completed, and a short editorial reference to it was made on page 879 of the same issue. By the courtesy of Mr. George H. Emerson, the company's Chief of Motive Power and Equipment, we are now able to reproduce an official photograph of the locomotive, together with drawings showing its principal dimensions and other details. The locomotive, as the illustrations show, is partly streamlined. It is classified J-1 and named *Lady Baltimore*. Together with the sister (4-6-4) engine it will be used for hauling the new aluminium streamlined train now being built and which will be ready for service very shortly. The plans for the building of the locomotive were prepared by the railway company's engineers.

The boiler is of the combined fire and water-tube type and carries a steam pressure of 350 lb. per sq. in. This type of boiler has already been applied to a number of other Baltimore & Ohio passenger and freight locomotives and in all cases has given excellent service. Although the locomotive is fitted with coupled wheels of 7 ft. dia., the boiler has been placed as low as possible in order to obtain a low centre of gravity above the rails. A lightweight trailing booster engine is provided to assist in smooth handling of the train when starting and for acceleration. The *Lady Baltimore* is painted blue to harmonise with the new trains under construction.

The equipment of the locomotive is interesting, as apart from the combined fire and water-tube boiler it includes a mechanical stoker, a four-wheeled trailer truck, with outside frames, a steel superheater header with rolled-in units, vestibule cab, mechanical lubricator and driving axleboxes with adjustable quarter brasses. The front end is arranged with a concealed coupler and the tender truck

boxes have roller bearings. The tender is fitted with a water pick-up scoop, and an air pump, reservoirs and electric lighting generator.

The cylinders, measuring 17½ in. by 28 in. are placed outside the frames and drive the second pair of coupled wheels. Steam distribution is by 10-in. piston valves actuated by Walschaerts motion.

The locomotive has already made some exceptionally fast test runs on the Chicago Division, and has also given some successful results on various other divisions. It has run at a speed of 95 m.p.h. in an entirely satisfactory manner.

The following are the leading particulars:—

Cylinders, dia.	17½ in.
" piston stroke	28 in.
Wheels, coupled, dia. . . .	7 ft. 0 in.
Wheelbase, rigid	7 ft. 5 in.
" total engine	35 ft. 5½ in.
Boiler, steam pressure . . .	350 lb. per sq. in.
" heating surface, firebox including	
water tubes and arch tubes . .	523 sq. ft.
" heating surface, tubes	800 sq. ft.
" " " flues	457 sq. ft.
" " " total	1,780 sq. ft.
Superheater	351 sq. ft.
Combined total	2,131 sq. ft.
Grate area	61.75 sq. ft.
Weight of engine in working order . .	95½ tons (British).
Total weight of engine and tender . .	165 tons "
Adhesion weight	44½ tons "
Tractive force of engine	28,000 lb.
" " booster	7,000 lb.
" " total	35,000 lb.
Factor of adhesion without booster . .	3.56
" " with booster	3.91

The tender is carried upon two four-wheeled bogies and accommodates 14 U.S. tons of coal and 8,000 U.S. gallons of water.

The 4-6-4 high-speed locomotive already referred to is fitted with a large boiler and tender, but a number of its principal parts are interchangeable with those of the 4-4-4 type, and will be similarly arranged.

Selling Mileage in Bulk

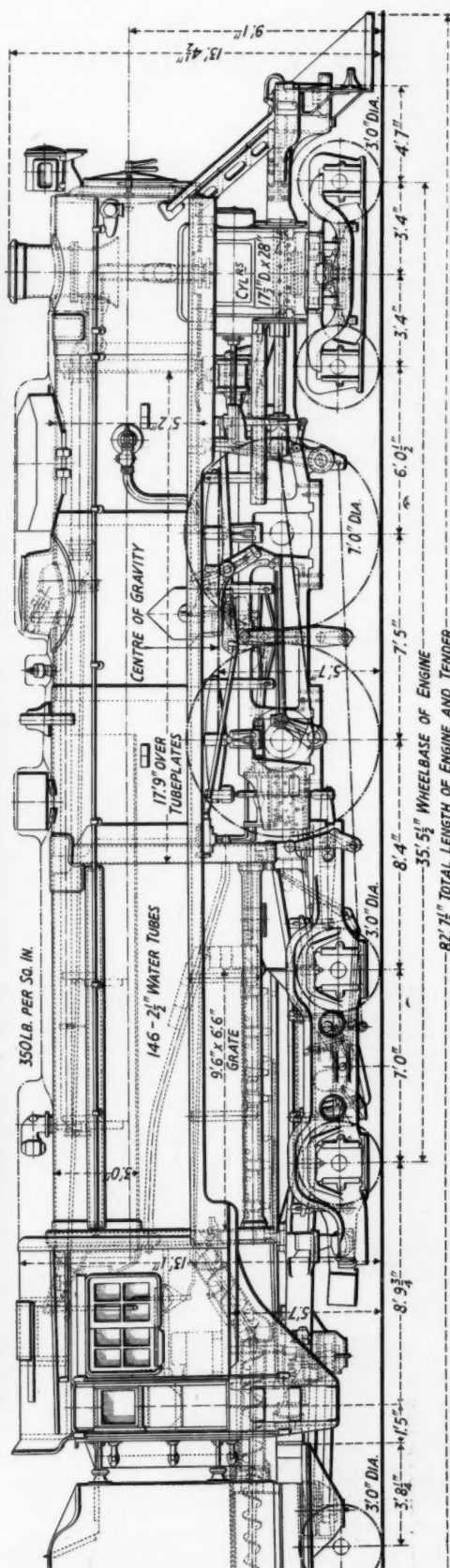
On page 90 of our January 18 issue, reference was made to the new issue of kilometre tickets in Belgium, whereby the experiment is to be tried of encouraging railway travel by the sale, at greatly reduced rates, of mileage in bulk.

The principle involved is that of completing a certain total mileage in a given time; 1,000 km. in one month, 5,000 km. in six months, or 10,000 km. in twelve months, the respective reductions on the ordinary fare tariff being 25 per cent., 35 per cent., and, if the whole year's coupon book be purchased, 50 per cent., which in effect allows the regular traveller to make his journeys at half-price. First-class travel in these conditions costs him, at the present rate of exchange, just under £30 for 10,000 km., and thus works out at 1.15d. a mile, whereas second-class travel

works out at only 0.77d., or roughly ¾d. a mile. As the tickets so obtained rank in every respect as ordinary tickets, and are available for use on all trains without restriction, a powerful incentive to railway travel is thus given.

Another interesting inducement, relating to interstate journeys, is advertised in the timetables of the Australian railways. Liberal reductions are made in the return fares between any two capitals of different States, provided that the purchaser is prepared to lodge a deposit, amounting to roughly one-third of the fare he pays, which will cover trips by rail in the State that he is about to visit.

Journeys covered by the deposit are also made at exceptionally low rates, so that here again strong encouragement is being given to rail travel by selling mileage in bulk.



General view and side elevation of the new lightweight 4-4-4 high-speed locomotive constructed at Mount Clare shops for the Baltimore & Ohio Railroad. It and a second engine of the 4-6-4 type are intended for use on light high-speed train schedules

MAIN LINE WIDENING NEAR MALDONADO JUNCTION, CENTRAL ARGENTINE RAILWAY

A work involving the construction of numerous large bridges, retaining walls, a new station and other works under heavy traffic

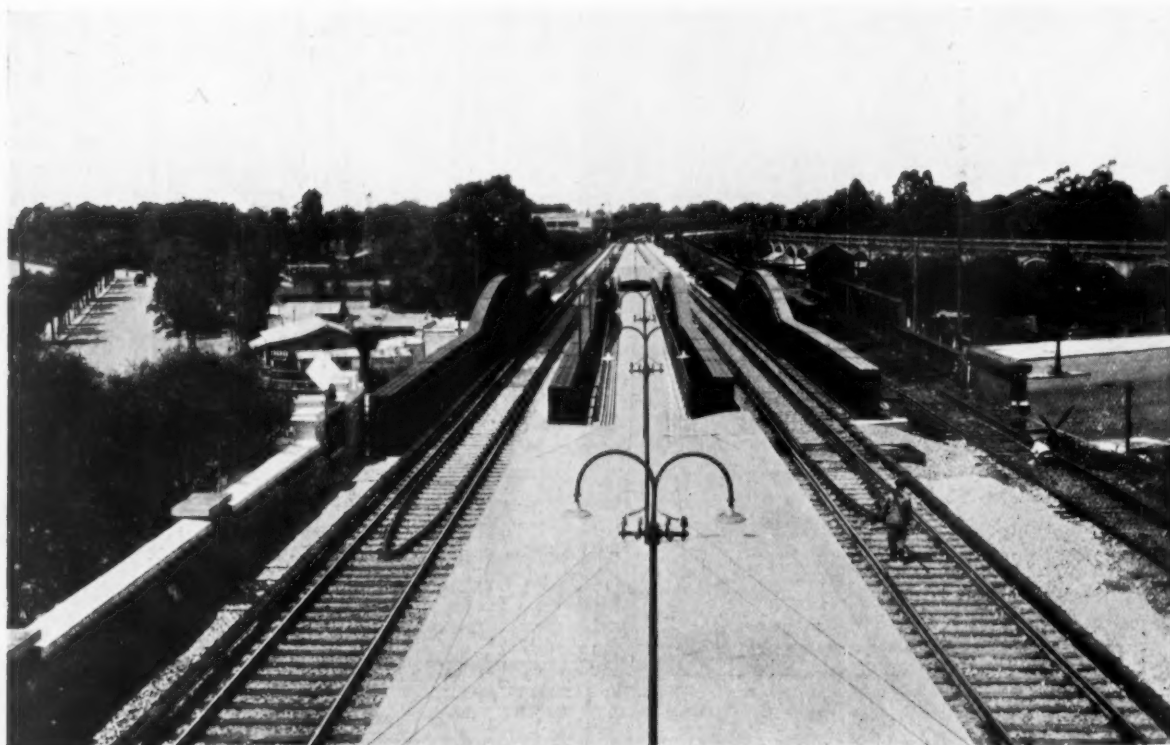
THIS widening, from a point some 5 km. from the Buenos Aires terminus on the Central Argentine main line to Rosario, marks the completion of the first stage of a project for the regrading of the suburban lines within the city boundary and the quadrupling of the tracks between Maldonado and Coghlan junctions, a distance of 5.642 km. It entailed the demolition of the last remaining section of the viaduct erected in 1896-97, also the old Hipódromo station and the bridges spanning the Avenidas Tiro Federal and Alvear and the approach road to the Municipal yard preparatory to their being reconstructed on modern lines to meet the requirements of the Municipal authorities and the increasing demands of present-day suburban and main line traffic at one of the busiest points of the company's system.

The work involved the realignment of the main line between Maldonado Junction and Calle L. M. Campos, the reconstruction of the double track bridge spanning the Avenida Tiro Federal, the construction of a bridge over the new road leading to the Gimnasia y Esgrima Athletic Club, and of a conduit to carry the waters of the Maldonado stream under a newly-formed bank. Also the reconstruction of the double-track bridge over the Avenida Alvear, the construction of a new high-level passenger

station to replace the old structure, and a new bridge over Calle Cerviño to replace the old bridge that gave access to the Municipal yard. In consequence of the re-alignment of tracks, a retaining wall along Calle Dorrego to support the high level tracks and station was also necessary. To deal with station and track drainage a pipe 1.00 m. diameter was constructed beneath the bank, extending from Calle Campos to the Avenida Alvear.

Construction operations started in July, 1929, and would have been completed before the end of 1931, had the financial crisis not intervened, obliging the company to adopt a policy of economy and retrenchment, thereby retarding the progress of the work.

The construction scheme involved a length of some 1.6 km. of double-track electrified line carrying an intensive suburban traffic, in addition to a heavy main line passenger and goods service. Consequently special arrangements were necessary to ensure that the work was carried out in stages so that the ordinary traffic was not interfered with, and so smoothly did the plans work out that the normal suburban and main line services proceeded without interruption throughout the period of reconstruction. With this end in view, the new tracks were realigned to permit of the construction of the new



Central Argentine Railway widening at Maldonado Junction, showing new bridge over Avenida Alvear and footwalk between main girders



Above : New bridge over the Avenida Alvear

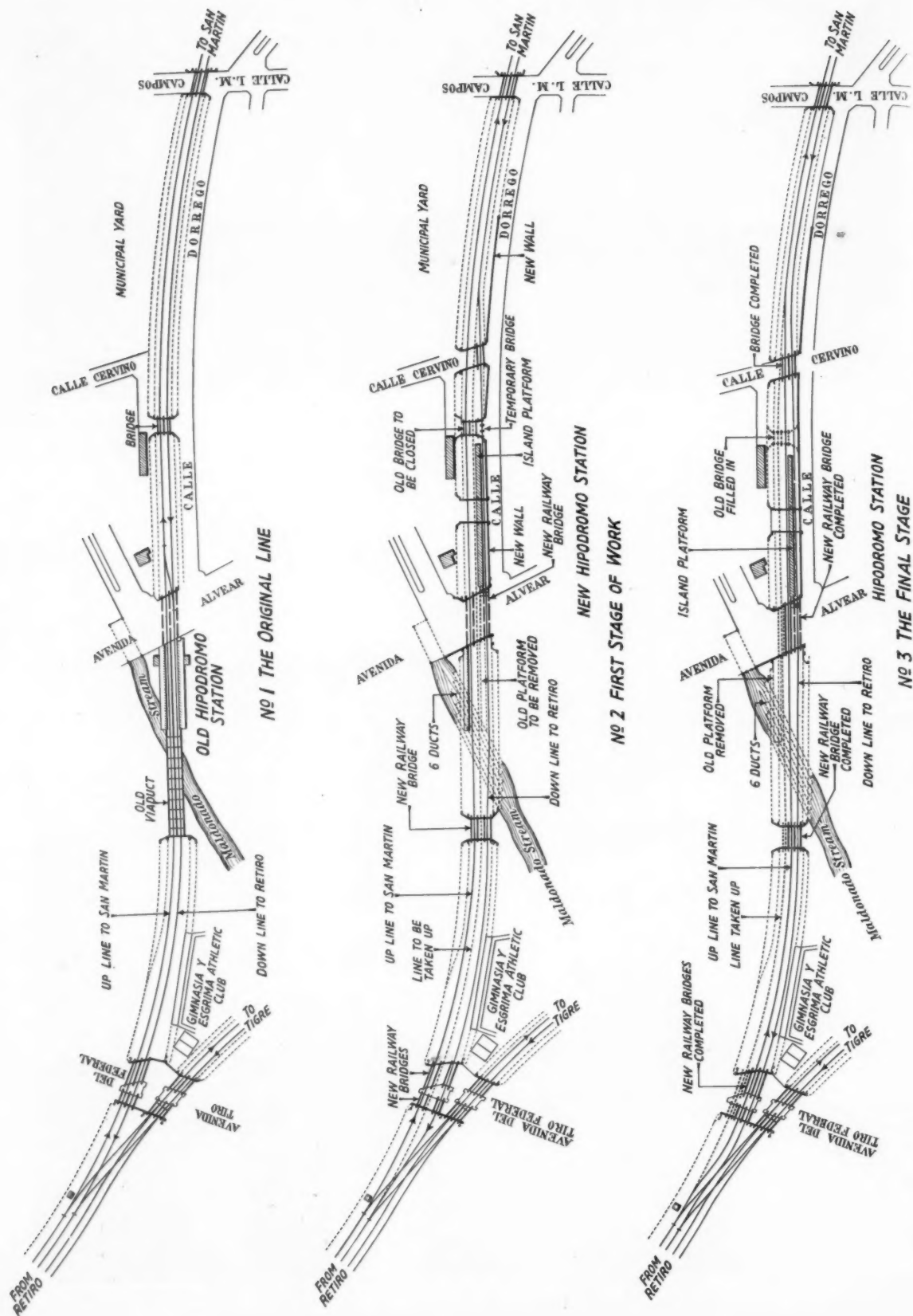


Left : Maldonado conduit in course of construction, with the old viaduct in the background

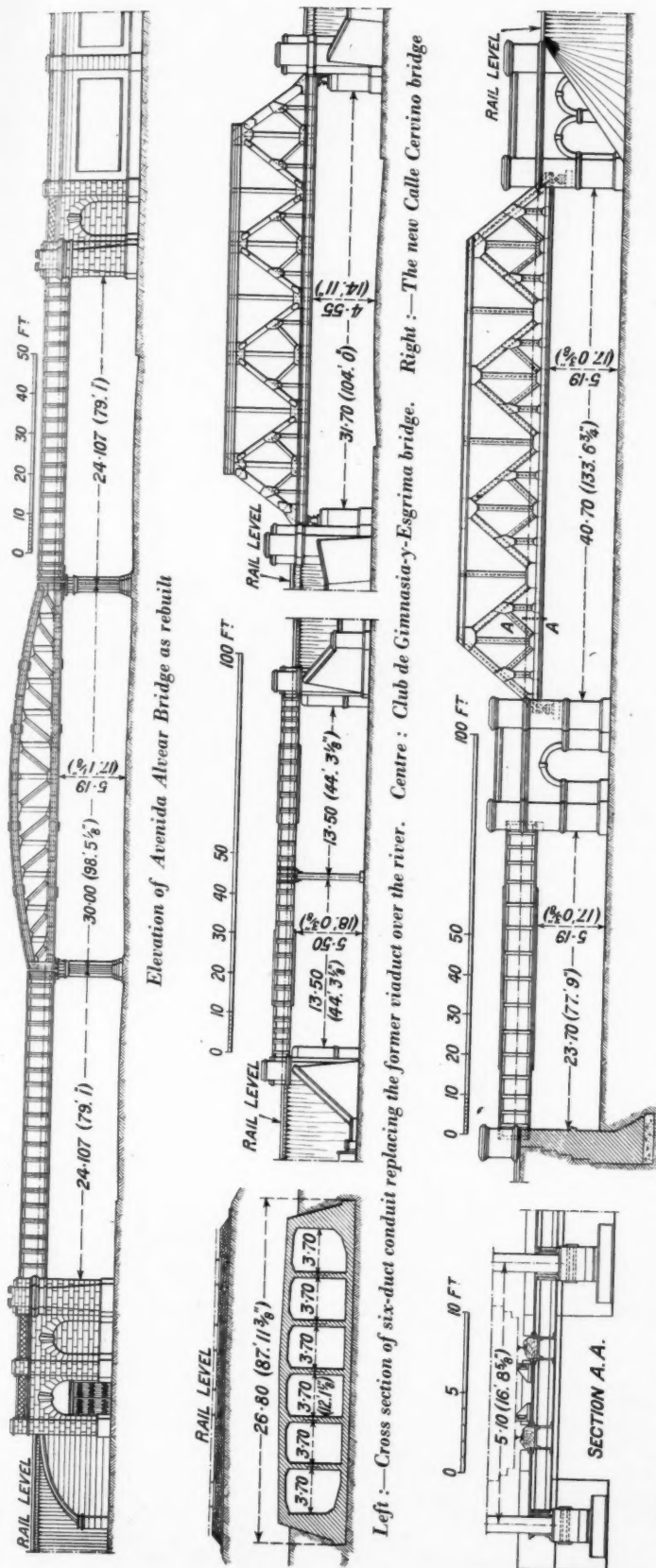
Right : The conduit completed showing the new embankment being tipped over it prior to the demolition of the old viaduct



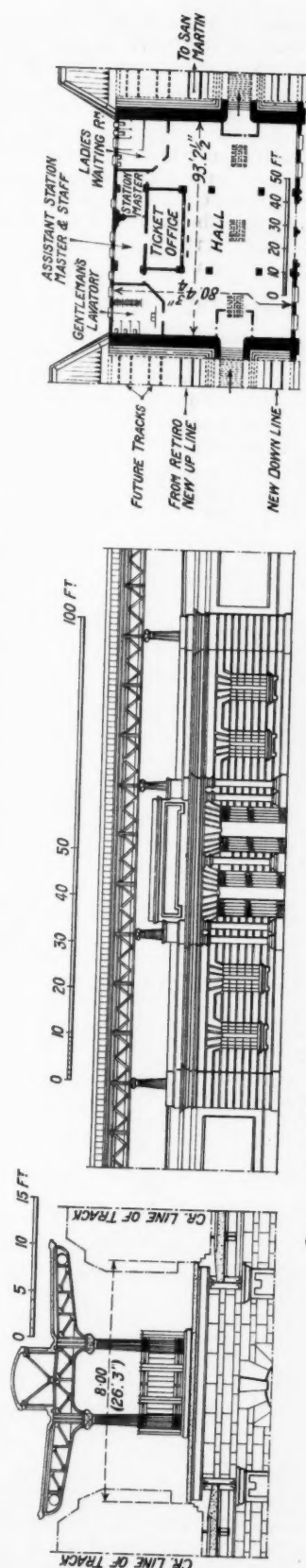
MAIN LINE WIDENING, CENTRAL ARGENTINE RAILWAY



Diagrams illustrating various stages in the work of track re-alignment, bridge and station reconstruction on the Central Argentine widening scheme near Hipodromo station. Note the replacement of the viaduct by a six-duct conduit



New bridge spanning the Avenida del Tiro Federal: its spans are separated longitudinally by a pier structure, triangular in plan, as shown in the diagrams on page 204. The cross section above (left) is through the larger span floor at A.A.



down line clear of the existing tracks. The entire scheme was carried out in the following three stages:—

(1) Construction of the new down line, complete with bridgework, &c., without interfering with the existing tracks.

(2) Linking up this new line at each end of the work with the existing down line, after which the old down line was dismantled and a start made on the construction of the up line and the necessary bridgework.

(3) Joining up the new up line at both ends of the work with the existing track, and demolishing the remaining portion of the old up line.

Types of Track and Bridgework Used

Both tracks were laid with 100-lb. B.S. "R" section rails, fastened by cast-iron chairs to hardwood sleepers, and equipped with conductor rail, in accordance with the company's standard practice on its electrified lines. The bridge over the Avenida Tiro Federal is a double-track structure, consisting of two through spans, 40.70 m. and 23.70 m. in length. The main span is of the lattice-girder type, while the smaller is of the plate-girder type. The floors in both cases are plated, and the track is carried throughout the bridge on longitudinal, hardwood rail-bearers laid over the stringers. The piers and abutments, which have been constructed in extension of those already existing, are of brickwork, suitably plastered with ornamental mouldings and caps. The existing abutments and piers have been left in position, and will be utilised when the projected quadrupling of the tracks is carried out later on.

The new opening giving access to the Gimnasia y Esgrima Club is crossed by a double-track bridge of two spans of 13.50 m. Both spans are of the plate-girder type, with a floor similar to that of the bridge over the Avenida Tiro Federal. Built-up columns have been used for the pier, and new abutments have been constructed in brickwork, with an extension on the up side, in anticipation of the future quadruplication scheme.

Avenida Alvear Bridge

A three-span bridge has been constructed over the Avenida Alvear. The centre span is of the bow-string lattice girder type, and measures 30 m. between centres of bearings. The side spans are of the plate-girder type, and are each 24 m. in length between centres of bearings. Steel floor troughing, carrying stone-ballasted tracks, has been provided throughout this bridge. Although double track is carried, this bridge is, as illustrated on page 202, virtually two single-track structures, one carrying the up line, and the other the down line. A paved footwalk, carried between the inner girders, gives access to the station platform. The piers are composed of structural columns, around the bases of which street islands have been formed. Due to the setting-back of the building lines on both sides of the Avenida, new abutments have been constructed, similar in type to those of the bridges previously described. A novel feature of the east abutment is the built-in entrance and stairway leading to the footwalk between the spans, allowing passengers to approach the station platform from the east side of the avenida.

Calle Cerviño Bridge

To replace the old bridge which spanned the entrance to the Municipal yard, and at the request of the municipality, it was agreed to open Calle Cerviño by means of a 32-m. span. This bridge is also a double-track structure, with three main girders of the lattice type, with horizontal top boom and floor similar to that of the bridge over Avenida Alvear. New abutments were constructed

and, as in the case of the other bridges, provision has been made for a future extension on the up side.

A few years ago, the Government commenced the work of canalising and enclosing the Maldonado stream, the railway company being required to deal with that portion of the stream flowing through its property when the old viaduct was removed. A reinforced concrete conduit was constructed beneath the viaduct, extending between the limits of the company's property. Provision was made at each end of the work for joining up with the portion constructed by the Government. The conduit comprises six ducts, each measuring, approximately, 4 m. by 3.7 m., with suitably reinforced slab tops. Upon the completion of the conduit, earth was tipped over to form an embankment up to formation level, after which the viaduct was demolished. The Government has since completed its portion of the work on each side of the company's property, the Maldonado stream being now entirely covered in.

New Passenger Station

The new station facing Calle Dorrego, on the west side of Avenida Alvear, is designed to deal with the heavy



New bridge over the Calle Cervino giving access to the Municipal yard

passenger traffic on race days to and from the adjoining Palermo racecourse, and replaces the station which was formerly situated on the east side of the same thoroughfare, and was demolished at the same time as the viaduct. The station comprises a high-level island platform, 240 m. long by 8 m. wide, 172 m. of it being roofed over. The station building is constructed directly below at street level, and contains a spacious hall, waiting-room, lavatories, and booking offices, with staircases leading directly up to the platforms. The main entrance is situated on Calle Dorrego, but an additional entrance, with booking office, has been provided on the east side of Avenida Alvear.

Signalling

A provisional block section was established between Maldonado Junction and Calle Santa Fé during construction, but this was replaced by automatic signalling when this system was installed on the company's suburban lines.

The whole work was carried out under the direction of the company's late Chief Engineer, Mr. R. Kirby, M.Inst.C.E., and completed under the supervision of his successor, Mr. L. A. Woodbridge, M.Inst.C.E.

SOME RECENT MACHINE TOOLS

Axlebox planing machine—High-capacity rail planer—Duplex tapping machine and automatic drilling and boring machine

NEW and improved machine tools which from time to time are produced by British manufacturing firms are in some cases adaptable to specified railway shop require-

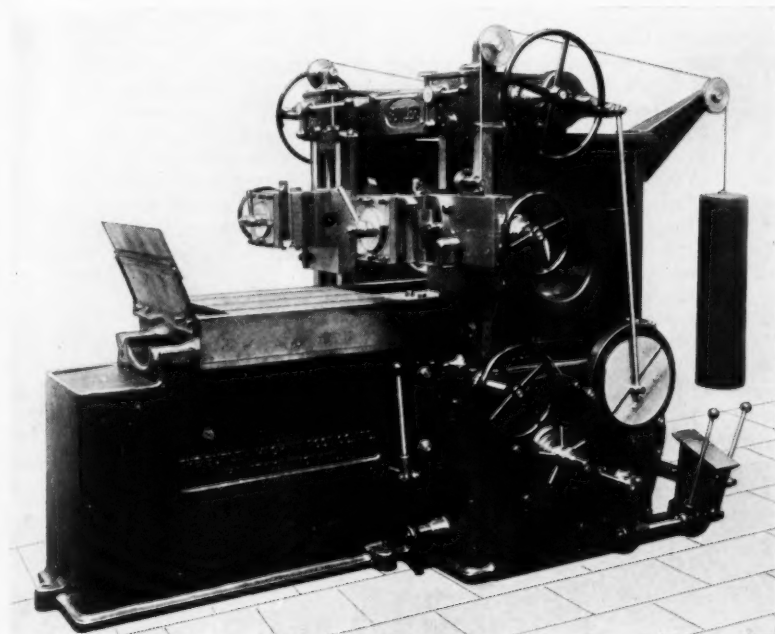
and is undergibbed for the full length. Five inches of adjustment is provided for setting the table and work in relation to the toolboxes. The uprights are of

exceptional strength, being of rectangular construction with a wide cross rail at the top, and are secured to the bed by fitted bolts. The drive is by single belt to a friction clutch pulley, thence through a six-speed gearbox to the stroke wheel, all gears being machine-cut in steel with keys for sliding gears machined from the solid shaft.

The stroke movement is of improved construction and great strength. The link motion is of unique design, for which a patent is pending. By its use the usual connecting rod between the link and the ram is avoided and two troublesome pin joints eliminated. The toolboxes have power feed vertically and horizontally over the tables and are balanced to ensure smooth finish and easy manipulation. The friction clutch and gearbox controls are duplicated at front and rear of the machine. To enable the operator to work with the greatest speed and facility a number of gauging features have been incorporated in the machine.

Stirk High-Capacity Planers

Machine tools manufactured by John Stirk & Sons Ltd. of Halifax and to

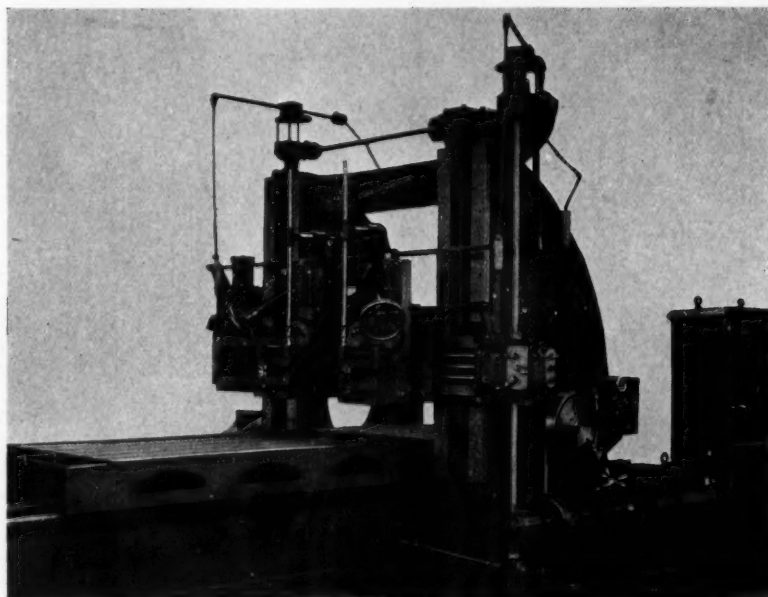


Butler axlebox planing machine

ments and in others have a more general application. Certain of those illustrated and described herewith conform more particularly to the latter category. In view of the wide ramifications of railway works and the extensive scope of the operations undertaken, it is nowadays a matter of some difficulty to eliminate many machines designed primarily for other classes of work.

Butler Axlebox Planer

A new 24-in. stroke axlebox planer, manufactured by the Butler Machine Tool Co. Ltd. of Halifax, is illustrated above. This machine has been designed specially for the quick machining of railway axleboxes with one toolbox operating on each side of the axlebox. It is specially suitable for repair work where the dimensions of the boxes vary, and is a really efficient machine on production work where repetition is required. The bed is of massive construction with full depth trough at each end for collecting surplus oil. The table runs on vee slides



Stirk high-capacity rail planer at Redbridge works, Southern Railway

which the names Hiloplane, Hiloplow, Planoplow, and Railprow have been given, have been supplied for track work, cylinders and numerous other operations to practically all home, Irish, foreign and Colonial railways. The Railprow illustrated herewith is the firm's latest development in extra massive machines for heavy duty in hard materials, whilst the latest types of Hiloplanes are built with practically any speed required for using tungsten carbide and similar cutting tools up to such extreme speeds as 360 ft. per minute, although such speeds as these are as yet rarely called for. The Planoplow is a universal machine in which these extreme characteristics are combined.

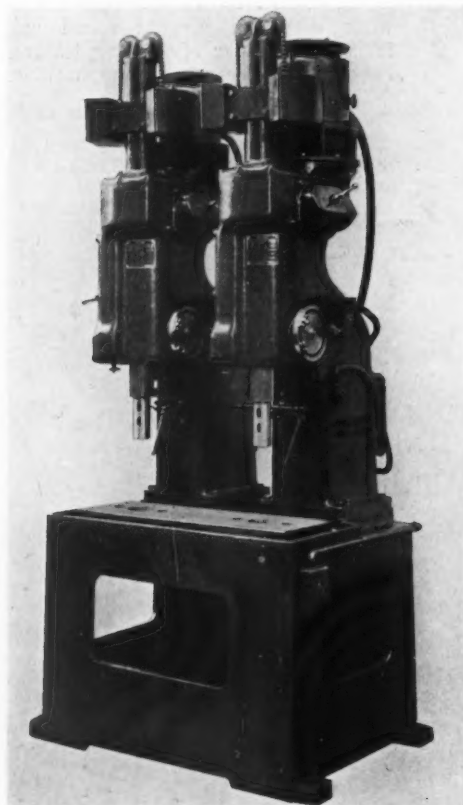
Referring in more detail to the machine illustrated, this is built for planing switch rails, points and crossings and any similar extra-heavy duty at low and moderate speeds, with the maximum possible return speeds. The bed rests on the ground for its full length. It is of the firm's original continuous plate type with double walls where subject to driving strains and solid bushed bearings for the main shafts. The table slides on flat ways with adjustable side strips in convenient sections. It is of the box type and tee slots are cut from the solid, and square stop holes are cast through the top plate. The bottom plate is continuous, and openings in the side allow cuttings to be withdrawn from the interior. Troughs are also provided at each end to catch cuttings, &c. No reversing dogs are required on the table edge as these are carried on the patent stroke disc, which enables the stroke to be varied with the utmost facility. The housings are firmly tongued, keyed and bolted to the bed. The cross slide is raised and lowered by power, elevating screws being driven by enclosed worm gears. The heads may operate

in the same direction or converge and diverge as desired. Driving gears, including rack, are of high tensile steel, keyless throughout.

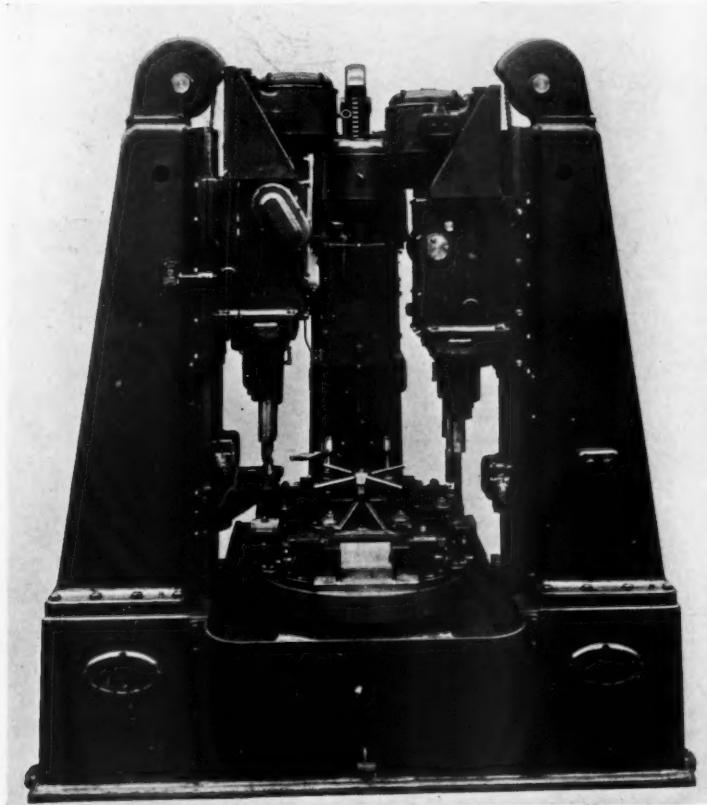
The drive is by the firm's patent split field reversing motor equipment, embodying motor generator taking current from d.c. or a.c. mains and delivering variable voltage direct current to the table motor. Standard speeds of 12/60 ft. per minute for the cut and 80/120 ft. per minute for the return are provided, but faster or slower speeds in the same ratio can be furnished for any special requirements. Electric feeds are by special motor and feed box, and take place with minimum movement of the table. They are eight in number and readily changed and reversed. Electric quick power traverses are provided to all heads and these are controlled by a balanced pendant switch, which also embodies push buttons to start, stop and "inch" table. All gearing is machine-cut from the solid, of steel where necessary and where specified above. Automatic lubrication is given to sliding ways by rollers in oil boxes, and by multiple sight feed lubricators to all bearings in the bed. The machine illustrated was supplied to the Southern Railway and is in use at Redbridge, near Southampton, where there are already Stirk machines in use.

Duplex Tapping Machine

Two new machine tools recently completed by Kitchen & Wade Ltd., of Halifax, are illustrated below. That shown on the left is a Duplex tapping machine designed for repetition tapping of unions, junction boxes and other fittings. The smaller head, on the left, is for taps from $\frac{1}{2}$ in. to $1\frac{1}{2}$ in. B.S.F. and the larger for taps from $1\frac{1}{2}$ in. to 2 in. The machine is entirely



K. & W. new Duplex tapping machine



K. & W. six-spindle automatic drilling, boring and reamering machine

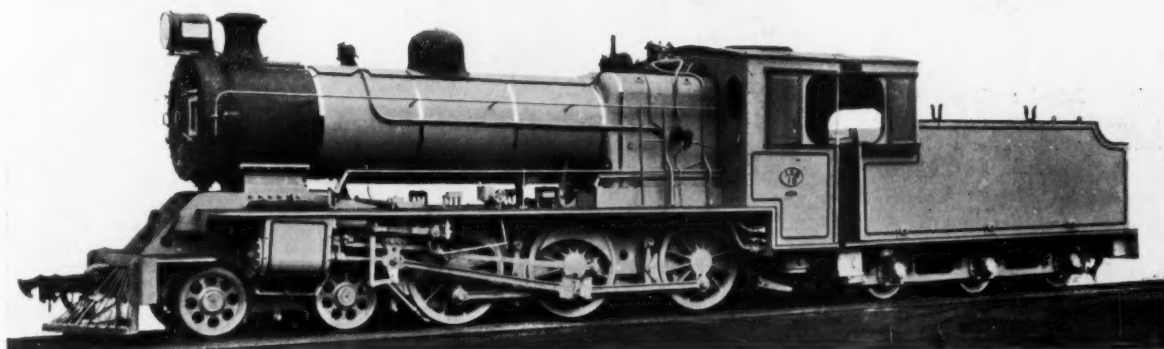
automatic and continuous in operation, being timed in its cycles to allow the operator to unload and reload whilst the spindle is in top position. The bed is arranged to receive quick loading fixtures, which are not shown in the illustration. The spindles have definite tapping leads changed by pick off gears, and reverse electrically at a 2:1 ratio. The driving gears run in oil and the final drive to the six-splined spindle is by hard steel and phosphor bronze spiral gears.

The other machine on p. 208 is a six-spindle automatic

primarily designed for boring aeroplane connecting rods, although it can be put to other uses. It incorporates three of Kitchen and Wade's cam unit heads, each with two spindles. A four-station table allows the operator to unload and reload whilst the heads are on production, thus ensuring a continuous output. The first head drills the two holes in the rod, and simultaneously the second head point tools out the bores, whilst the third head is reaming. The control is electrical and the machine presents a very business-like appearance.

NEW METRE GAUGE LOCOMOTIVES FOR INDIA

Three 4-6-0 type engines built by W. G. Bagnall Limited, Stafford, for the Junagad State Railway



THREE locomotives, one of which is illustrated, have recently been completed by W. G. Bagnall Limited, Castle Engine Works, Stafford, for the Junagad State Railway, India. These engines, which have been built under the inspection of Robert White & Partners, Consulting Engineers, London, are of the latest type, incorporating wide fireboxes above the frames and hopper type ashpans. The advantages of the wide type of firebox are mainly that it enables a larger grate area to be obtained, whilst the firebox can be put in from underneath after the back plate is riveted in position, and, further, most of the stays are easily accessible without removing the boiler from the frames. In these particular locomotives the grate area is 20.7 sq. ft., whereas had a narrow type firebox been fitted the figure would have been only 15 sq. ft. The increased grate area naturally represents a considerable advantage.

The following are the leading particulars:—

Cylinders, dia.	14½ in.
" piston stroke	22 in.
Wheels, coupled, dia.	4 ft. 0 in.
" bogie, dia.	2 ft. 4½ in.
Wheelbase, rigid	11 ft. 0 in.
" total (engine)	20 ft. 0½ in.
Heating surface, tubes	935 sq. ft.
" arch tubes	9 sq. ft.
" firebox	87 sq. ft.
" total	1,031 sq. ft.
Grate area	20.7 sq. ft.
Working pressure	180 lb. per sq. in.

The tender is of the six-wheel pattern with a water capacity of 2,200 gallons and a coal capacity of 4 tons.

In working order the engine and tender weigh 60.757 tons, of which 26 tons are available for adhesion, and at 85 per cent. of the boiler pressure the tractive effort is 14,744 lb.

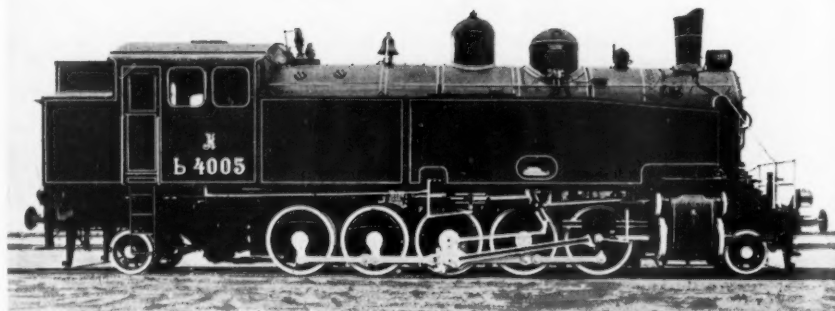
The equipment of the locomotives includes the following special fittings: Pyle national headlight apparatus, Ross pop safety valves, top feed clackbox, Clyde superior soot blowers, Evrit blow-off cocks, steel tubes, copper firebox (one engine has a steel firebox), vacuum brake, Lambert sanding gear, and Wakefield four feed mechanical lubricator.

NORTHERN IRELAND TRAFFICS.—Statistics of railway traffic and receipts in Northern Ireland for the first ten months of 1934, which have been furnished by the Ministry of Commerce, make comparisons with 1932, in view of the abnormal position created by the strike early in 1933. On railways wholly in Northern Ireland the number of passengers in the ten 1934 months was 5,297,355, against 5,321,280, although for the month of October the number in 1934 was 350,681 against 333,952. The tonnage of merchandise and minerals for the ten 1934 months was only 481,098, against 612,485. Receipts from passengers (including season tickets) for the ten 1934 months were £241,666, against £244,372; but in October, 1934, the figures were £15,929 against £15,826. Goods traffic receipts for the ten 1934 months were £160,952 against £213,939 in 1932. On railways partly in Northern Ireland the number of passengers in the ten 1934 months was 4,915,384, against 5,315,272 for the first ten months of 1932, and the receipts from passengers were £393,074 against £425,488, although the figure for October, 1934, was £29,672 against £28,973 for October, 1932. Goods and livestock receipts for the ten 1934 months amounted to £537,921 against £685,093, and the tonnage of goods and minerals was 859,733 against 999,162.



*Above: Harbin station,
Chinese Eastern Railway.
See Overseas Railway Affairs,
page 191*

*Right: 2-10-2 tank locomotive,
Chinese Eastern Railway,
built by the Skoda Works,
Pilsen*



Left: L.M.S.R. containers being used to transport 3,000,000 bricks from a Lancashire brickworks to the bottom of a tunnel under Mumbles Head, near Swansea, without a single brick being touched by hand intermediately. These bricks, of a special type, are being used to form the lining of very large subterranean tanks for the Swansea main drainage scheme. Five wagon loads of the bricks in containers have been leaving the works at Accrington daily. On arrival at Swansea the containers are unloaded by crane on to a motor lorry, which conveys them to the head of the working shaft at Mumbles Head. Here the containers are lifted off the lorry by another crane and are lowered down the shaft, as shown in our picture, on to trolleys in the tunnel beneath, whence they are conveyed to the working face many feet underground. The 3,000,000 bricks will be conveyed in 6,000 container loads, and the work, now nearing completion, will have taken a year to carry out

RAILWAY NEWS SECTION

PERSONAL

The King has been pleased to confer upon Lieutenant-Colonel Sir Wyndham Portal, Bart., D.S.O., M.V.O., a Director of the Great Western Railway—whose elevation to the peerage was announced in the New Year Honours list, published in our issue of January 4—the title of Baron Portal of Laverstoke in the County of Southampton.

The London Passenger Transport Board announces that, consequent upon the death of Sir John Gilbert, the Appointing Trustees, acting under the provisions of Section I of the London Passenger Transport Act, 1933, have appointed Mr. Charles Latham, J.P., L.C.C., to be a part-time member of the board for a period of three years from January 21, 1935.

G.W.R. APPOINTMENTS

The following appointments were announced on January 28 by the Great Western Railway:—

Mr. R. W. Dawe, Assistant Analyst, Swindon Laboratory, to be Chief Analytical Chemist and Chief of Research Department, Swindon Laboratory.

Mr. A. H. Lawson, Draughtsman, Swindon, to be Assistant Manager, Locomotive Factory, Swindon.

Mr. E. T. Davies, Assistant Divisional Engineer, Paddington, to be Assistant, Chief Engineer's office, Paddington.

Mr. E. C. Cookson, Assistant Divisional Engineer, Plymouth, to be Assistant Divisional Engineer, Paddington.

Mr. N. S. Cox, Assistant, Divisional Engineer's office, Gloucester, to be Assistant Divisional Engineer, Plymouth.

Mr. W. J. Pepler, Stationmaster, Swindon Junction, to be Chief Clerk, Divisional Superintendent's office, Bristol.

Mr. S. M. Taylor, Stationmaster, Bath, to be Stationmaster, Swindon Junction.

Mr. J. Allen, Canvasser, D.S.O., Bristol, to be Stationmaster, Bath.

Mr. W. Nicholls, Stationmaster and Quay Superintendent, Fowey, to be Stationmaster, Wolverhampton.

From the *London Gazette* dated January 25:—Engineer and Railway Staff Corps—Major E. L. Hawkins resigns his commission (January 23, 1935). Major Hawkins—as announced in *THE RAILWAY GAZETTE* of November 2 and 16 last—has retired from the

position of Assistant Engineer (Maintenance), Southern Area, L.N.E.R.

The London Midland & Scottish Railway announces that, following upon the retirement of Mr. E. Wharton—recorded in *THE RAILWAY GAZETTE* of January 4—the separate office of Mineral Manager is to be discontinued, and the work of the Mineral Department brought within the re-

that year. Mr. Ashton Davies became Passenger Manager in 1931, and was selected to fill the then newly-created post of Chief Commercial Manager in July, 1932, the position he still retains with the work of the Mineral Department added to its duties. He was awarded the Institute of Transport Railway (Operating) Gold Medal in 1930, and was elected Chairman of the Railway Clearing House, Coaching Traffic Superintendents' and Goods Managers' Conferences for the year 1934. He had twice previously held the penultimate office, during 1927 and 1930.

Lt.-Col. L. Manton, R.E., Commandant of the Royal Engineers' Railway Training Centre, Longmoor, is not "retiring," as stated in the report in last week's issue of the annual dinner of the G.W.R. Units Supplementary Reserve. The report should have read that he is "vacating his appointment" on completion of tenure.

SOUTH AFRICAN RAILWAYS AND HARBOURS SERVICE COMMISSION

The personnel of the Commission has now been gazetted. Its constitution provides that the Chairman of the Union Public Service Commission shall also be the Chairman of the Railways and Harbours Commission. This dual position is held by Mr. Graham Cross. The other members of the Commission are Lt.-Col. A. Herschell (previously System Manager at Durban) and Mr. C. G. C. Rocher (previously Assistant Chief Civil Engineer). The appointments are for five years with effect from January 1, 1935.

Mr. W. A. Messer, whose retirement from the position of Permanent Way Assistant, Southern Railway, was announced in *THE RAILWAY GAZETTE* of January 11, received his technical training at King's College, and was then articled to the late Mr. A. T. Walmisley, Dover Harbour Engineer. In 1890 he served as Resident Engineer on the construction of the Rawtenstall tramways (Lancs). In 1891 he received an appointment in the Bridge Department of the Great Western Railway at Paddington, but in 1896 transferred to the service of the South Eastern Railway and was placed in charge of widening works in the London district. This led to his appointment as Engineer in Charge of Permanent Way to the South Eastern & Chatham Railway. The position he occupied for 20 years



Mr. Ashton Davies, M.B.E.,

within whose responsibilities as Chief Commercial Manager, L.M.S.R. the work of the Mineral Department is now brought

responsibilities of Mr. Ashton Davies, the Chief Commercial Manager.

Mr. Ashton Davies, M.B.E., entered the Telegraph Department of the Lancashire and Yorkshire Railway in 1890. He subsequently went to the Passenger Superintendent's office and eventually became Personal Assistant to that officer. He was appointed Superintendent of the Line in 1919. Upon the amalgamations in 1921 and 1923, Mr. Ashton Davies became first, Northern Divisional General Superintendent, London & North Western Railway, and then General Superintendent, Western Division, L.M.S.R. In 1924, he was appointed General Superintendent (Freight Services) on January 1, and General Superintendent (Passenger Commercial) in August of

prior to his appointment, in 1923, as Permanent Way Assistant to the Chief Engineer, Southern Railway, from which he retired on December 31 last.

About 100 of Mr. Messer's old colleagues and friends marked the occasion of his retirement by presenting him with a silver tea service with a tray suitably inscribed. The presentation was made by the Chief Engineer, Mr. G. Ellson, on January 21 in the presence of a large gathering of the staff. Mr. Ellson referred to Mr. Messer's 38 years' service, and thanked him for his loyal and good work,



Mr. W. A. Messer, A.M.Inst.C.E.,
Permanent Way Assistant to the Chief Engineer,
Southern Railway, 1923-34

remarking that he had never failed him in the execution of his responsible duties. He wished him many years of happy and pleasant retirement in his new home at Worthing. Mr. Messer, in the course of his reply of thanks, recalled some past experiences and also said that he wished to thank all his old personal staff for the loyalty and assistance they had given him during their long association.

It is with regret that we have to record the death in London, on January 25, of Major-General Raymond de Candolle, C.B., M.Inst.C.E. Born in 1864 of Swiss parents, he was brought up in England and educated at Rugby and at Trinity College, Cambridge. He early gained railway experience and was from 1908 to 1911 Assistant General Manager of the Buenos Ayres Great Southern Railway. After 1911 he visited the United States and Canada as a special agent for the four great Argentine Railways, and on his return to South America made a valuable report on North American methods in connection with the storage and transportation of grain. On January 1, 1914, he was appointed General Manager of the Buenos Ayres Great Southern Railway, but early in the war resigned this position to devote

himself to war work for the British Government. In May, 1917, he was given a Government appointment on a special railway mission to Roumania, and was created C.B. in 1918 for his valuable services in that connection. Later he was sent out, with the rank of Major-General, to Mesopotamia to supervise transport there. In September, 1921, he was appointed General Manager of the Ottoman Railway from Smyrna to Aidin, but weakened health caused his retirement from active railway work in March, 1923. He had been a member of the Institution of Civil Engineers since February 7, 1911. The funeral took place at Brookwood on Tuesday.

Major T. Calvert, M.B.E., retired on January 28 from the position of Chief Stevedore to the Goole Steam Shipping (L.M.S.R.), which he has occupied since it was taken over from the private owning company by the Lancashire & Yorkshire Railway, 29 years ago. Major Calvert was previously Chief Wharfinger to the Aire and Calder Navigation for 13 years. During the war his special ability to handle extraordinary consignments was recognised, and he was entrusted with rolling stock and other abnormal shipments at Goole and Calais, where he rose to be Deputy Assistant Director of Docks, with the rank of Major, and his meritorious services were rewarded with the M.B.E. Appreciative letters have been received of Major Calvert's services from many quarters, none of which is couched in more felicitous terms than the one from Sir Ralph Wedgwood, C.B., C.M.G., who was Director of Docks in France during the war and who speaks most highly of Major Calvert's work there. At the conclusion of hostilities Major Calvert returned to the service of the Goole Steam Shipping and has seen the safe loading and unloading on its behalf of 9,305,600 tons of goods and 8,904,000 tons of coal, coke and pitch, figures which are even more remarkable when it is remembered that the general cargoes included lions, tigers, canaries, trams, steam rollers and dairy produce. Major Calvert has been responsible for the innovation of one or two noted improvements in gear for the handling of awkward cargo, particularly in regard to plate dogs employed in the lifting of iron plates of awkward dimensions which are, by his methods, much more safely handled than by ordinary slings or chains. Whilst at Calais he was responsible for putting up what is believed to be a world's record for miscellaneous cargo, in connection with the discharging of the ss. *Baron Napier*, which was loaded with 6,386 tons of general cargo. This cargo, handled during weather involving occasional heavy showers, was dealt with at the average rate of 323.34 tons an hour, from start to finish. Major Calvert goes into retirement with the honour and respect of all who know him.

Mr. H. W. J. Powell, F.S.I., F.A.I., who, as announced in THE RAILWAY GAZETTE of January 18, has been appointed Estate and Rating Surveyor, Southern Area, L.N.E.R., was born in 1898 and educated at Etonhurst, Weston-super-Mare, Monkton House School, Cardiff, and the College of Estate Management, Lincoln's Inn Fields. He was articled with Messrs. Parry, Adkin & Parry, of Victoria Street, Westminster, and during the Great War enlisted as a private at the age of 16 and gained a commission a year later; he saw service in Belgium,



Mr. H. W. J. Powell, F.S.I., F.A.I.,
Appointed Estate and Rating Surveyor,
Southern Area, L.N.E.R.

Italy, France and Germany. At the age of 29 he was appointed County Valuer for Glamorgan and until now has still been the youngest county valuer in the kingdom. Until his father's death in 1929 he was partner in the firm of Messrs. Powell & Powell, Cardiff and Newport, and then became the principal of it. Mr. Powell was recently appointed one of the four rating surveyors in private practice to act on the sub-committee of the Central Valuation Committee in London and is the author of the Glamorgan Regional Survey Scheme, which, as well as being adopted by the Central Valuation Committee in London, has been recommended to all rating authorities throughout the country. Mr. Powell is a Fellow of the Chartered Surveyors' Institution and of the Auctioneers' and Estate Agents' Institution and an Associate of the Institute of Structural Engineers.

Mr. R. Gardiner, Assistant Superintendent (Eastern Section), Southern Area, L.N.E.R., has been appointed Superintendent, Southern Scottish Area, L.N.E.R., in succession to Mr. C. H. Stemp, who will shortly retire from the service under the age limit.

Permanent Way Institution—Annual Dinner

Mr. W. K. Wallace, Chief Engineer of the London Midland & Scottish Railway Company, took the chair at the annual winter dinner of the Permanent Way Institution, of which he had just been elected President, on Saturday last. Those present included:—

Mr. D. R. Bennett, Major Biddulph, Messrs. R. Carpmal, J. H. Condy, H. A. Conisbee, A. R. Cooper, E. R. Dashper, A. W. M. Dyke, G. Ellison, C. E. Fairburn, R. W. Cairns, H. Garth, R. F. B. Gaudin, H. J. Green, R. S. Griffiths, H. James, J. A. Kay, G. F. Kent, F. Lawson, E. J. H. Lemon, C. A. G. Linton, J. W. Melville, J. Miller, R. F. Morkill, Lt.-Col. Peck, Messrs. A. S. Quartermaine, V. A. M. Robertson, C. P. Sandberg, O. F. A. Sandberg, T. H. Seaton, C. E. R. Sherrington, Major J. C. G. Spooner, Messrs. E. Treacher, D. D. Williams, L. Wynn Williams, W. A. Willox, and Major G. R. S. Wilson.

Mr. E. J. H. Lemon, Vice-President of the London Midland & Scottish Railway, proposing the toast of "The Permanent Way Institution," complimented the permanent way staff on the safety of railway travel. In 1933, out of 19 accidents on the railways of Great Britain which were investigated by the Ministry of Transport Inspecting Officers, only one could be attributed to any defect in the permanent way or structures. As an indication that railways were not a back number but still had an important function to perform, it should be remembered that to move a ton of traffic by rail required fewer units than to move a ton of traffic on the road by means of the internal combustion engine. One might ask "Then where is this saving in running costs being wasted?" or, in other words, "Why are the railways not paying handsome dividends?" In this matter the engineering staff and the traffic operating staff had equal responsibilities. The traffic problem, as Mr. Lemon viewed it, was that the railways had something to sell, and they had either to sell it at a price which was below that of their competitors, or charge the same price for better services.

Members of the civil engineering profession and their predecessors had been at work for 100 years; was it not possible that some things being done to-day were not being done in the most economical manner—that traditions were being carried on which ought to be re-examined in the light of modern conditions?

Higher Speeds on the Way

Much could be accomplished by the application of scientific research, in the use of improved methods, better materials, and by careful analysis of labour costs. Train speeds would have to be increased, there being a ready sale for speed. It was something which appealed to the public now and which would appeal still more to the future generation. But increased speeds would have to be obtained without increased maintenance expenditure, and without sacrifice of the railways' record of safety. This question of speed was

affected very considerably by the imposition of speed restrictions. It cost the railway considerable sums of money every year to slow up trains for speed restrictions. Restrictions of 10 m.p.h. were often imposed when speeds of 30 m.p.h. would be safe. One means by which scientific methods might be employed was in the use of the ciné-camera. A slow-motion picture might reveal faults which would escape the notice of a person actually watching the operation. A great drawback in the organisation of big concerns such as railways was the difficulty of getting in touch with the men who actually did the work. Travelling round the districts took considerable time, but there was no reason why the "talkie" film should not be used as a means of acquainting the staff of the best way of doing a job.

Machinery to Save Labour

The more intensive use of machinery should have the effect not only of making possible a reduction of expenditure, but of lightening the curse of Adam, which was surely what everyone aimed at. If the volume of railway traffic were to drop in the future, the ratio between gross receipts and net receipts would still have to be maintained. There was scope for the better use of capital assets, some of which were in use only three or four hours a day. If all members of the staff co-operated and pooled their knowledge, as did the members of the Permanent Way Institution, then they would be contributing to an early return of prosperity to the railway industry.

Mr. George Ellison, Chief Engineer of the Southern Railway, proposing the toast of "The President," said that all members of the Institution would agree that in Mr. Wallace they had a President who would carry on the excellent work of the institution. Dealing with the question of proposed examinations and issue of diplomas, Mr. Ellison congratulated the institution on its decision to proceed with the scheme.

Mr. W. K. Wallace, responding, said that he was conscious of having taken on a serious task in succeeding Mr. Cooper in the Presidency. Regarding Mr. Lemon's stimulating address, he would say that on the L.M.S. the question of speed restrictions had received special attention, and some improvement had already been effected. With regard to working costs, he considered the discussions which took place at the sectional meetings of the institution made an important contribution.

Mr. Raymond Carpmal, Chief Engineer of the Great Western Railway, proposed the toast of "The Past-President." Not only had Mr. Cooper, as Chief Engineer of the Underground Railways of London, been responsible for maintenance work, but also for the many important developments of recent years which had made London

Transport a model for the whole world. During 1934 Mr. Cooper had also been Chairman of the Civil Engineer's Committee of the Railway Clearing House and had discharged the duties of that position with diplomacy and tact. During Mr. Cooper's term of office as President of the Institution, four new sections had been formed and the membership had increased to 28.3 per cent. in excess of the figure for 1932. The success which attended the celebration of the Institution's Jubilee in July had also been due very largely to Mr. Cooper's personal interest.

Mr. Cooper, in response, said that the institution was run on lines of decentralisation with great success, there being some 20 sections in the United Kingdom and abroad. The members forming these sections were exceedingly keen, and only a little interest and encouragement from headquarters was required to bring out the best results. The year 1934 had been a great year in the history of the institution, and those who took part in the Jubilee Convention would not soon forget it. The assistance rendered by the railway companies went to show that the managements appreciated the good work which the Institution carried out. Mr. Carpmal's reference to the improvements effected on the Underground Railways in recent years should not, Mr. Cooper emphasised, lead the audience to suppose that he alone was responsible. He would like to take the opportunity of paying a tribute to the Chairman and Vice-Chairman, Lord Ashfield and Mr. Frank Pick respectively, and the other L.P.T.B. officers.

Mr. John Miller proposed the toast of "The Guests," making special mention of the ladies; Mr. Lemon, whom they regarded as a very distinguished guest; Mr. C. E. Fairburn, Chief Electrical Engineer of the London Midland & Scottish Railway; Major J. R. Wilson, one of the Railway Inspecting Engineers of the Ministry of Transport; Mr. C. E. R. Sherrington, Secretary of the Railway Research Service, whose services were of such great value to the companies; and Mr. J. A. Kay, Managing Director of THE RAILWAY GAZETTE, of which it must be said that no railwayman could consider himself up-to-date unless he read it. Mr. Kay was a very good friend of the institution, and all would pronounce him and his paper O.K.

Mr. C. E. Fairburn responded to the toast on behalf of the guests, and expressed appreciation of the hospitality extended to them.

Major J. C. G. Spooner, the institution's Vice-President for the Malay States, who is on leave in England, proposed the toast of "Absent Friends." Major Spooner said that he was voicing the opinion of all overseas members in saying that they much appreciated being affiliated to the institution. He desired to make special mention of the benefits derived from a study of the contents of the *Journal*.

(See editorial on page 182)

RAILWAY AND OTHER MEETINGS

BENGAL AND NORTH WESTERN RAILWAY CO. LTD.

The ordinary general meeting of the Bengal & North Western Railway Co. Ltd. was held on Tuesday, January 29, at Winchester House, Old Broad Street, E.C.2, Sir Henry P. Burt, K.C.I.E., C.B.E. (Chairman of the company) presiding.

Mr. F. A. Wake (Acting Managing Director) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said it was with the utmost regret that he had to refer to the great loss the company had sustained by the death of Mr. Edward Christian on April 3 last. Mr. Christian had been a director of the company for over 28 years, and by his death the board had lost a colleague who had endeared himself to each one of them by the charm of his personality and the proprietors were deprived of the services of one who ever watched over their interests. The board had elected Sir Malcolm Hogg to fill the vacancy, and they welcomed him there that day. Sir Malcolm was a Deputy Chairman of the Westminster Bank and was for some time a Member of the Council of the Secretary of State for India. His wide knowledge of India and his administrative and financial experience would be of the greatest value to the board.

The Managing Director, Lieut.-Col. W. R. Izat, D.S.O., R.E., was absent from the meeting, as he had been deputed by the board to visit India to inspect the company's property, especially in the districts that had been so severely devastated by the recent earthquake and by the floods in the Sonopore district.

The gross earnings of the joint undertaking compared with those of a year ago had fallen only by about Rs. 3½ lakhs, which, under the circumstances, might be considered fortunate. On the company's own line the gross earnings increased by nearly Rs. 6 lakhs, but on the Tirhut line, owing to the disorganisation of traffic caused by the earthquake, the earnings fell off by about Rs. 9½ lakhs.

The number of passengers carried and the receipts therefrom continued to show a falling off. It was thought, however, that but for the earthquake and the complete stoppage of through rail communication on the main line during August and September, owing to the breaching of the line during the extremely high flood in the Ganges, the earnings from their coaching traffic would have shown a slight increase. It was feared that no substantial increase could be expected in their passenger earnings until an improvement took place in the spending power of those who travelled third class. At present, to save the cost of their fares, their journeys, whenever possible, were made

on foot, which meant a considerable loss to the railway, as it was on the third class traffic that they relied almost entirely for their passenger receipts.

Goods traffic, on the other hand, showed an increase of over 166,000 in tons lifted and of nearly Rs. 2 lakhs in receipts, which was due principally to the continued development of the sugar industry. But it might be mentioned that their earnings from goods traffic would have been considerably higher but for the heavy traffic carried at very low rates to relieve the situation caused by the earthquake.

Working expenses increased by only Rs. 2.36 lakhs. The amount charged off on account of repairs due to the damage caused by the earthquake was, as stated in paragraph 14 of the report, Rs. 7.68 lakhs. On the other hand there were considerable savings in locomotive and carriage and wagon expenses compared with those of a year ago, due mainly to a large saving in the cost of coal and to the cost of renewing 200 covered goods wagons having been charged off last year. The percentage of working expenses to gross earnings rose from 44.76 to 45.94, a figure which, in all the circumstances of the case, might be regarded as very satisfactory.

The company's share of the net earnings, as shown in the net revenue account, amounted to £782,739, being £10,419 more than last year. After adding the gain by exchange over the book rate of 1s. 6d. per rupee amounting to £1,819, and making the necessary adjustments for income tax, payment of interest on debenture and preference stocks, interim dividend and bonus, providing, as usual, the £35,000 for sinking fund, and utilising £46,636, being the interest on reserves, &c., for the half-year ended September 30, 1934, the amount to be dealt with was £310,711.

From this the board recommended the payment of a final dividend of 7 per cent. together with a bonus of 1 per cent., making for the whole year a total dividend and bonus of 16 per cent., the same as for the last three years. This meant an increase of the carry forward by £3,699 to £100,711.

Two events of outstanding importance and gravity occurred during the year, viz., the severe earthquake in January last and the abnormal floods in August. With regard to the earthquake, they circulated recently to all shareholders a very clear and full report of the disaster which showed how widespread and great the damage caused thereby had been, extending over a continuous distance of about 900 miles, mainly on the Tirhut section. Taking everything into consideration and remembering that over that length of railway hardly a mile remained undisturbed, that not a bridge remained un-

damaged, many being completely destroyed, the total cost of the repairs, approximately Rs. 23 lakhs, had not been so heavy as might have been anticipated. The company's section suffered much less severely than the Tirhut section, and the restoration work on their own section, costing only Rs. 4 lakhs, would be completed and fully charged off during the current year. By the commencement of the rains the whole railway had been reopened for traffic with the exception of the Sagauli-Raxaul branch and the small length of line between Riga and Sitamarhi. The last section, however, which remained closed to traffic, viz., between Dhang and Bairagnia, was reopened on the 26th of last month. A good deal of work still remained to be done, of course, on the Tirhut section in rebuilding certain bridges where temporary arrangements had had to be made for crossing the rivers, in general repair to the permanent way and in the replacement of ballast lost owing to the subsidence of embankments and tracks.

The next visitation which the company had to encounter was the floods which occurred on many sections of the line, notably in the Bapiah area, from spill water from the Kosi intensified by the drainage channels having been partially blocked by silt exuded during the earthquake. Probably by another year further scouring would enable the flood water to flow away as rapidly as it had done in the past.

Then the Ganges spill water gave rise to very high flood levels against the main line from Chupra as far east as Thana Bihpur. The high level of the Ganges combined with heavy floods in the Sone and Gogra rivers caused, however, the most serious trouble. The line between Dighwara and Sonopore stations was breached in several places due to the action of the villagers in cutting the embankment, with the result that railway communications on the main line were entirely closed for 34 days, entailing a loss in earnings of about Rs. 6 lakhs. Much damage also occurred between Chupra Kacheri and Khaira.

It would be remembered that very heavy floods on the Dighwara-Sonopore section were experienced in 1923 when the line was breached in several places through similar action taken by the villagers. Government had now been asked to appoint a committee to recommend what measures should be adopted to cope with such a position in future, as also to consider the question of providing additional waterways between Sitalpur and Sonopore, and it was hoped that this committee would submit their recommendations at an early date. It was thought that about 1,500 ft. of extra bridging would be required, but the recommendations of the committee must be awaited before that question could be settled.

He was glad to say that the floods caused no serious damage to their large

bridges, and it was satisfactory to note that in the case of the Elgin and Kosi Bridges which had given rise to some anxiety in recent years, the rivers showed signs of straightening out and of taking a more direct course through the bridges.

Regarding the prospects for the immediate future, he did not like to be too optimistic. When one realised the enormous destruction which took place as the result of earthquakes and floods such as they had suffered from during the past year, caution was, he thought, necessary in making any forecast of their probable earnings for the current year. The earning power of the railway, however, was as good as ever, and while expenditure must be higher owing to the cost of the work of restoration and the provision for rolling stock renewals, it was hoped, now that there appeared to be an improvement in the general economic situation, that their earnings would not be unsatisfactory. Lest it should be thought that what he had said about the earthquake inadequately pictured the ruin and devastation brought about, he had placed on the table some photographs which could be inspected after the meeting by any shareholder who would like to look at them, as they showed more clearly than could be described in words the havoc which was wrought. The resolution was carried unanimously.

THE MIDLAND RAILWAY COMPANY OF WESTERN AUSTRALIA LIMITED

The ordinary general meeting of the Midland Railway Company of Western Australia Limited was held at Winchester House, Old Broad Street, E.C., on Thursday, January 31, Sir George Alexander Touche, Bart. (Chairman of the company), presiding. The Secretary (Mr. William Tait) read the notice convening the meeting and the auditors' report.

The Chairman, in moving the adoption of the report and accounts, said that the year under review revealed a slight degree of recovery from the previous depression. Goods traffic receipts were £158,207, an increase of £1,502 on the preceding year. The net receipts made a better comparison still, the figure of £86,088 showing an increase of £3,631. Working expenses, at £72,119, had been reduced by £2,129, and amounted to 45.48 per cent. of gross receipts, comparing with 47.38 per cent. in 1933.

Traffic receipts showed increases of £2,447 under livestock traffic and £1,596 under general goods. Traffic between Government railway stations increased all round, amounting to £9,894, but this was counteracted by a decline in local and through traffic of £8,298, largely due to the agricultural depression. Wheat production had fallen and the area estimated as under cultivation for the current harvest was estimated at 2,896,000 acres, or a drop of 493,352 in two years.

Net revenue had increased by £478,

to £75,825. As in previous years, the major allocation of available net revenue had been to depreciation and renewals account. £21,013 were spent under this head, as against £17,475 in 1933, and a further £30,000 had been transferred to this account to provide for expenditure on the work now in progress on reconditioning and rebalasting the permanent way, and to allow for further requirements. A heavy drain on the company's resources was the rate of exchange, since £125½ of Australian currency were required to provide £100 sterling. The exchange contingency account had therefore been increased by £2,500 to £35,000.

Four years had passed since a dividend was paid on the unified ordinary stock, and he regretted that the board still had to call on the forbearance of shareholders, since any dividend could be but a wraith and it was better to wait for one of flesh and blood. The situation with regard to sales of land remained as it had been for three years. Areas reverting to the company due to purchasers being unable to fulfil their contracts were 21,211 acres in excess of the amount sold. On June 30, 1934, the company had 681,434 acres unsold in its possession. Concluding with a review of the general situation in Australia, the Chairman said that the budget surplus of £1,301,570, instead of an estimated deficit of £1,176,490, reflected great credit on the Commonwealth and justified hope and confidence in the future.

The report and accounts were unanimously adopted.

Railway and Other Reports

Metropolitan Railway Surplus Lands Co. Ltd.—A dividend is recommended of 2½ per cent. for the half year ended December 31, making 3½ per cent. for the year—transferring £2,000 to reserve and carrying forward £2,501 14s. 6d. to next year.

Mersey Railway.—The Secretary writes, January 25:—The directors of the Mersey Railway at their meeting on the 24th instant, resolved to pay the full dividend of 3 per cent. on the perpetual preference stock and to recommend a payment of a dividend of ½ per cent. on the ordinary stock. The dividend on the ordinary stock for 1933 was ½ per cent.

Scottish Motor Traction Co. Ltd.—The recent report of this company which is jointly controlled by the L.M.S. and L.N.E. Railway Companies and by Tilling & British Automobile Traction Limited, shows that the profit for the year ended October 31, 1934, after providing for depreciation and income tax, and including dividends from subsidiary companies, amounts to £163,789. The preference dividend takes £49,905, leaving a balance of £113,884, out of which the directors have transferred £24,001 to contingency reserve and £25,000 to general reserve. They recommend payment of a dividend on the ordinary shares at the rate of 10 per cent. per annum, which absorbs £62,198, leaving a balance of £2,685. This balance, added to £57,396 brought in, the directors propose to carry forward.

Forthcoming Events

- Feb. 4 (Mon.).—G.W.R. (Birmingham) Lecture and Debating Society, at Great Western Hotel, Snow Hill Station, 6.30 p.m. "Maintenance of a Railway Engineering Division," by Mr. H. S. B. Whitley.
- Permanent Way Institution (York), at Railway Inst., Queen Street, 6.30 p.m. "Maintenance and Renewal of Permanent Way," by Mr. J. E. Taylor.
- Society of Engineers, at Geological Society, Burlington House, Piccadilly, London, W.1, 6 p.m. Inaugural Meeting.
- Wimbledon and District Model Railway Club, Alt Grove, St. George's Road, London, S.W.19, 8 p.m. Annual General Meeting.
- Feb. 5 (Tues.).—Industrial Transport Association, at British Iron and Steel Federation, Caxton House (East), Tothill Street, London, S.W.1, 6.30 p.m. "How Traffic Managers can Assist the 'Safety First' Movement," by Lt.-Col. J. A. Pickard.
- Institute of Transport (Bristol), at the University, 5.40 p.m. "Bills of Lading and Charter Parties," by Mr. C. Hartly-Hodder.
- Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. "Railway Organisation," by Mr. E. E. Potter.
- L.N.E.R. (Newcastle and Sunderland) Lecture and Debating Society, at Newcastle, 7 p.m. "Bye-ways of 18th Century—Engineering in North of England," by Dr. A. Raistrick.
- Feb. 6 (Wed.).—Retired Railway Officers' Society, at Abercorn Rooms, Liverpool Street, London, E.C.2, 2.30 p.m. Annual General Meeting.
- Feb. 7 (Thurs.).—G.W.R. (London) Lecture and Debating Society, in General Meeting Room, Paddington Station, 5.45 p.m. "Railway Electrification in Italy and Switzerland," by Major G. A. B. Leishman.

Institution of Electrical Engineers, at Grosvenor House, Park Lane, London, W.1, 7 for 7.30 p.m. Annual Dinner.

Southern Railway (London) Lecture and Debating Society, at Chapter House, St. Thomas's Street, London Bridge, S.E.1, 5.45 p.m. "Railway Statistics," by Mr. M. G. Hicks.

Feb. 9 (Sat.).—Crewe Technical College Engineering Society. "The Application of Tapered Roller Bearings in Railway Service," by Mr. J. E. Spear.

L.N.E.R. (Great Central) Lecture and Debating Society, at Alderman Newton Boys' School, High Cross Street, Leicester, 5 p.m. "Electrical Arc Welding," by Mr. Carpenter.

Permanent Way Institution (Manchester-Liverpool) at Victoria Station, Manchester, 3 p.m. "Signalling," by Mr. J. W. Cocking.

Forthcoming Meetings

- Feb. 6 (Wed.).—Forth Bridge Railway (Statutory General), King's Cross Station, London, N.W.1, at 11.15 a.m.
- Feb. 12 (Tues.).—Oldham, Ashton-under-Lyne & Guide Bridge Junction Railway (Ordinary Annual), King's Cross Station, London, N.W.1, at 11.15 a.m.
- Feb. 12 (Tues.).—Whitechapel & Bow Railway (Ordinary General), 55, Broadway, Westminster, S.W.1, at 2.45 p.m.
- Feb. 13 (Wed.).—Fishguard & Rosslare Railways & Harbours (Half-Yearly Ordinary), Paddington Station, London, W.2, at 1 p.m.
- Mar. 29 (Fri.).—Zafra & Huelva Railway (Ordinary General), Calle de Ayala 54 Bajo Derecha, Madrid, at 5 p.m.

NOTES AND NEWS

More Mechanical Washing Machines, Southern Railway.—Mechanical train-washing appliances are being installed by the Southern Railway at Selhurst, Orpington, Slades Green, and Clapham Junction.

Glasgow Train Accident : Driver Acquitted.—At Glasgow last Wednesday, David Kerr, the driver of one of the trains involved in the collision near Cumberland Street, Glasgow, last September, in which nine persons lost their lives, was acquitted of the charge of culpable homicide and was discharged.

Russian Train Accident : Railwaymen Sentenced.—At Leningrad last Saturday a stationmaster and other railwaymen were sentenced to terms of imprisonment ranging from three to ten years in connection with the collision on January 6, near Porbelo, in which 23 persons lost their lives.

New Isle of Man Air Mail Service.—The Postmaster-General has announced that a new inland air mail service between Liverpool and the Isle of Man for the conveyance of letters, letter packets and postcards will commence to-day, February 1. The service will be entrusted to Olley Air Service Limited.

New All-steel Rolling Stock in Belgium.—The composition flooring used in the new all-steel carriages of the Belgian National Railways, described and illustrated in our issue of January 25, is Decolite, and the heat and sound insulation referred to in the article was achieved by means of sprayed Limpet asbestos. Both of these are British products and were supplied by J. W. Roberts Limited, of Leeds, as sub-contractors.

Permanent Way Institution President.—At the winter general meeting, held at the Institution of Civil Engineers on Saturday last, Mr. W. K. Wallace was installed as President, in succession to Mr. A. R. Cooper, who gave an excellent paper, entitled "London Underground Railways—Some Features of Engineering Interest," this being illustrated with a number of interesting lantern slides. A very satisfactory financial position and a record membership were reported.

Agreed Charges.—The Railway Rates Tribunal has approved a charge agreed by the four amalgamated railway companies, the London Passenger Transport Board, and the Mersey Railway Company with F. W. Woolworth & Co. Ltd. for the carriage of merchandise sent for sale or use to its stores for the period January 1 to December 31, 1935. The agreed charge is a payment of £4 5s. per cent. of the purchase price paid by Woolworth's for the goods to which the charge is applicable. A

similar arrangement had previously yielded more revenue to the railway companies from Woolworth's traffic, and a further increase was anticipated.

Anniversary of World's First Postal Train.—To-day, February 1, is the eightieth anniversary of the running, by the G.W.R., between London and Bristol of the world's first postal train. Prior to this date, no train had ever been run exclusively for the use of the Post Office. The details of this landmark in mail transport were set out in a leader on travelling post offices published in our issue of September 7 last.

A New 16 mm. Sound Film Projector.—The possibilities of sub-standard cinematograph film in railway publicity work have already been demonstrated in the success attending public exhibitions of the L.M.S. record of the Royal Scot tour in America. The development of talking picture apparatus in the handy and portable 16 mm. size will therefore be watched with special interest. A new projector designed by the British Thomson-Houston Co. Ltd., Rugby, has now made its appearance. The equipment includes projector, mains unit and loud-speaker with amplifier. Sound-on-film reproduction is used, dispensing with records and synchronising apparatus.

French Liners to Call at Southampton.—On Wednesday, January 30, the French liner *Ile de France* called at Southampton for the first time on her voyage from Havre to New York. Hitherto the English port of call has been Plymouth, which will remain the port of call for the eastbound liners. To mark the occasion a civic welcome was given by the Deputy Mayor and Sheriff of Southampton to the 45,000-ton ship when she came alongside the new quay about 9 p.m. With a party of guests of the French Line, an inspection was made of the ship, and brief addresses were given by M. Pierre de Malglaive, Managing Director of the French Line, Councillor W. Buck, Deputy Mayor of Southampton, and Commandant Thoreux, the captain of the ship.

British Railway Stockholders' Union Luncheon.—Mr. William Whitelaw, Chairman of the L.N.E.R., was the principal guest and speaker at the British Railway Stockholders' Union luncheon, held at Gatti's Restaurant, London, on January 29. In the absence of the Chairman, Sir Charles Stuart-Williams, in India, Mr. D. Ross-Johnson presided over the large and representative company attending, and, after warning his hearers against undue optimism, he introduced Mr. Whitelaw. In the course of a speech, in which he explained various financial points of interest to stockholders, Mr. Whitelaw

dealt with the question of expenditure, as recorded in an editorial note on page 181 of this issue. Mr. Ashley Brown, General Secretary to the Union, proposing a vote of thanks to Mr. Whitelaw, remarked that he was tired of pessimistic stockholders and others who surmised that in a few years railways would be entirely supplanted by air services. What of the 225 m.p.h. land speed proved to be practicable by the latest successful experiments abroad, he asked? Colonel Hilder seconded the motion of thanks, which was enthusiastically carried.

Kilsyth-Bonnybridge Train Service Withdrawal.—The L.M.S.R. and L.N.E.R. announce that on and from to-day, February 1, passengers will not be conveyed from and to Kilsyth (New), Banknock, Dennyloanhead, and Bonnybridge (Central) stations. Passenger train traffic will be dealt with as follows:—Kilsyth (New) at Kilsyth (Old), L.N.E.R.; Banknock and Dennyloanhead at Castlecary, L.N.E.R.; Bonnybridge (Central) at Bonnybridge, L.N.E.R. As from to-day, also, freight train traffic will cease to be dealt with at Dennyloanhead and Bonnybridge (Central) stations. Such traffic will, however, be received at and forwarded from Banknock and Colzium stations by the L.N.E.R.

Road Accidents.—The Ministry of Transport return for the week ended January 26 of persons killed or injured in road accidents is as follows:—

	Killed	Deaths resulting from previous accidents	Injured
England	87 (70)	26 (32)	2,955 (2,848)
Wales ...	4 (7)	2 (—)	111 (97)
Scotland	7 (6)	2 (1)	300 (277)
	98 (83)	30 (33)	3,366 (3,222)

The total fatalities for the week were, therefore, 128, as compared with 116 for the previous week.

Judgment in Lagny Disaster Trial.—Georges Daubigny, engine driver of the Strasbourg express, which ran into and wrecked the Nancy train on the main line of the Eastern Railway of France, near Lagny, on December 23, 1933, causing the death of more than 200 persons, was acquitted by the Court at Meaux on the charge of homicide by imprudence. The court delivered judgment on January 24. Judgment had been deferred following the trial, which began on December 19 last and lasted three days. Numerous considerations, on which the judgment was based, were given in detail by the Court. It recalled the allegations that Daubigny had overrun the signals covering the Nancy express and had driven his train at an imprudent speed in foggy weather. The railway technical experts in their inquiry had come to formal conclusions: the signals were closed (against the train); the catastrophe was due to the driver's inattention during about 40 seconds

and to that imprudence alone. A report of the proceedings appeared in THE RAILWAY GAZETTE issue of January 11. But, continued the Court, it could not be considered as admissible that the signalling system never fails. Various instances of signals abnormally open (at "clear") had been reported during the inquiry and also at the trial. Daubigny's counsel had put forward two suppositions to explain momentary failure of the signalling system. Although the chances of such a supposed combination of circumstances were extremely small, it was not an absolute impossibility that the signals had remained off. This left a doubt, and, however slight that doubt might be, the accused should have the benefit of it. With regard to the charge of excessive speed, the Court declared that the regulations did not make it obligatory for Daubigny to slacken speed. The Court, therefore, acquitted Daubigny. As a result of his acquittal, Daubigny, who was re-employed as a driver of slow passenger trains pending his trial, will be restored to his former position as driver of expresses.

Railway Interest in Channel Islands Airways.—Negotiations which have been continued for some time past between the G.W.R., the Southern Railway, Mr. W. L. Thurgood, of Jersey Airways Limited, and Whitehall Securities Corporation Limited have been brought to a successful conclusion, with the result that the parties have become jointly interested in the recently formed company known as Channel Islands Airways Limited. The new company will have a capital of £150,000, one-third of which is to be held by the two railway companies jointly, the other two parties holding one-third each. Channel Islands Airways Limited will operate daily services between the mainland and the Channel Islands with machines of the latest and fastest design, and operation in conjunction with Railway Air Services Limited, the company which is controlled by the four main line railways and Imperial Airways Limited, will render available the best air connections with the principal centres of Great Britain. (See editorial note, p. 183.)

British and Irish Railways Stocks and Shares

Stocks	Highest 1934	Lowest 1934	Prices	
			Jan. 30, 1935	Rise Fall
G.W.R.				
Cons. Ord. ...	661½	481½	531½	+1½
5% Con. Prefce. ...	118	109	119	+1½
5% Red. Pref. (1950) ...	115	107	116½	—
4% Deb. ...	117	105	117½	+1½
4½% Deb. ...	119	109	119½	—
4½% Deb. ...	129½	115½	128½	—
5% Deb. ...	135	126½	139½	+1
2½% Deb. ...	75	64	81½	+1½
5% Rt. Charge ...	1347½	123½	134½	+1
5% Cons. Guar. ...	132½	121½	134	+1½
L.M.S.R.				
Ord. ...	301½	191½	191½	—1½
4% Prefce. (1923) ...	64½	41	49	+1
4% Prefce. ...	87	69½	86	—
5% Red. Prf. (1955) ...	107	92½	106	—
4% Deb. ...	114½	100½	109½	—
5% Red. Deb. (1952) ...	118½ ¹⁶	111½	118½	—
4% Guar. ...	106½	96½	105	—
L.N.E.R.				
5% Pref. Ord. ...	245½	131½	131½	—1½
Def. Ord. ...	11½	67½	67½	—1½
4% First Prefce. ...	76	59½	69½	—2
4% Second Prefce. ...	47	25½	27½	—1½
5% Red. Pref. (1955) ...	94½	80	91½	—
4% First Guar. ...	104	92	102*	—
4% Second Guar. ...	97½	86½	97*	—
3% Deb. ...	90	74½	85½	—
4% Deb. ...	114	99½	109	—
5% Red. Deb. (1947) ...	117	108	117	—
4½% Sinking Fund Red. Deb.	111½	105½	110½	—
SOUTHERN				
Pref. Ord. ...	90	63½	81	+1
Def. Ord. ...	32½	19	20½	—1
5% Prefce. ...	118½ ¹⁶	107½	119½	—
5% Red. Pref. (1964) ...	115½	107½	116½	+1
5% Guar. Prefce. ...	132	120½	133½	+1
5% Red. Guar. Pref. (1957) ...	119½	113	120	—
4% Deb. ...	116½	103½	116	+1½
5% Deb. ...	134	124½ ¹⁶	134½	—
4% Red. Deb. ...	113½ ¹⁶	105½ ¹⁶	113½	—1½
1962-67				
BELFAST & C.D.				
Ord. ...	6	5	5½	—
FORTH BRIDGE				
4% Deb. ...	110	100	109½	—
4% Guar. ...	110	100	109½	—
G. NORTHERN (IRELAND)				
Ord. ...	95½	41½ ¹⁶	7	—
G. SOUTHERN (IRELAND)				
Ord. ...	25	12½	23½	+1
Prefce. ...	21½	13½ ¹⁶	25½	—
Guar. ...	48	39	57½	—1½
Deb. ...	67	59	79	+1
L.P.T.B.				
4½% "A" ...	126	115	128½	—
5% "A" ...	135½	124½	138½	—
4½% "T.F.A." ...	113½	107½	113	—
5% "B" ...	131½	118	130½	—
5% "C" ...	97	73	92	—3
MERSEY				
Ord. ...	151½	7	14	+4
4% Perp. Deb. ...	93½	82½	93½	—
3% Perp. Deb. ...	66½	61½	67½	—
3% Perp. Prefce. ...	54	44½	49½	+1

* ex dividend

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 4th Week			Totals to Date		
	1935	1934	Inc. or Dec.	1935	1934	Inc. or Dec.
L.M.S.R. (6,926 mls.)						
Passenger-train traffic...	357,000	351,000	+ 6,000	1,440,000	1,400,000	+ 40,000
Merchandise, &c. ...	438,000	434,000	+ 4,000	1,673,000	1,697,000	— 24,000
Coal and coke ...	275,000	284,000	— 9,000	1,056,000	1,080,000	— 24,000
Goods-train traffic ...	713,000	718,000	— 5,000	2,729,000	2,777,000	— 48,000
Total receipts ...	1,070,000	1,069,000	+ 1,000	4,169,000	4,177,000	— 8,000
L.N.E.R. (6,339 mls.)						
Passenger-train traffic...	237,000	230,000	+ 7,000	970,000	938,000	+ 32,000
Merchandise, &c. ...	320,000	329,000	— 9,000	1,215,000	1,233,000	— 18,000
Coal and coke ...	256,000	264,000	— 8,000	971,000	994,000	— 23,000
Goods-train traffic ...	576,000	593,000	— 17,000	2,186,000	2,227,000	— 41,000
Total receipts ...	813,000	823,000	— 10,000	3,156,000	3,165,000	— 9,000
G.W.R. (3,750½ mls.)						
Passenger-train traffic...	152,000	146,000	+ 6,000	640,000	618,000	+ 22,000
Merchandise, &c. ...	177,000	170,000	+ 7,000	696,000	676,000	+ 20,000
Coal and coke ...	108,000	110,000	— 2,000	425,000	441,000	— 16,000
Goods-train traffic ...	285,000	280,000	+ 5,000	1,121,000	1,117,000	+ 4,000
Total receipts ...	437,000	426,000	+ 11,000	1,761,000	1,735,000	+ 26,000
S.R. (2,172 mls.)						
Passenger-train traffic...	227,000	223,000	+ 4,000	941,000	913,000	+ 28,000
Merchandise, &c. ...	57,000	62,000	— 5,000	216,500	231,500	— 15,000
Coal and coke ...	39,000	39,000	—	137,500	146,500	— 9,000
Goods-train traffic ...	96,000	101,000	— 5,000	354,000	378,000	— 24,000
Total receipts ...	323,000	324,000	— 1,000	1,295,000	1,291,000	+ 4,000
Liverpool Overhead ...	1,098	1,097	+ 1	4,408	4,498	— 90
(6½ mls.)						
Mersey (4½ mls.) ...	4,169	4,202	— 33	17,300	17,608	— 308
* London Passenger Transport Board ...	514,500	501,500	+ 13,000	15,980,900	15,654,700	+ 326,200
IRELAND						
Belfast & C.D. pass. ...	1,833	1,849	— 16	7,401	7,396	+ 5
(80 mls.)						
" " goods ...	459	525	— 66	1,687	1,902	— 215
" " total ...	2,292	2,374	— 82	9,088	9,298	— 210
Great Northern pass. ...	7,350	6,500	+ 850	31,350	27,900	+ 3,450
(543 mls.)						
" " goods ...	8,000	9,000	— 1,000	31,650	30,700	+ 950
" " total ...	15,350	15,500	— 150	63,000	58,600	+ 4,400
Great Southern pass. ...	17,064	16,846	+ 218	74,237	72,641	+ 1,596
(2,124 mls.)						
" " goods ...	37,564	32,416	+ 5,148	163,018	119,742	+ 43,276
" " total ...	54,628	49,262	+ 5,366	237,255	192,383	+ 44,872

* 30th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes

CONTRACTS AND TENDERS

Ransomes & Rapier Limited has secured an order from the G.W.R. for a 6-ton standard petrol-driven mobile crane for use in container traffic at Temple Meads goods station, and similar to one recently supplied by the same firm to the G.W.R. for use at Swansea.

Tourist Coach Orders, L.N.E.R.

The Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the L.N.E.R. for four twin articulated third class tourist coaches.

The Birmingham Railway Carriage & Wagon Co. Ltd. has received orders from the L.N.E.R. for five open third-brake tourist train coaches and two tourist train buffet cars. This stock, together with that in the Metropolitan-Cammell Company's order announced above, will form one complete tourist train set and three third-brake spares.

Locomotives for L.N.E.R.

The North British Locomotive Co. Ltd. has received an order from the L.N.E.R. for 20 class K3 three-cylinder 2-6-0 mixed freight locomotives with six-wheeled tenders.

The North British Locomotive Co. Ltd. has also received orders from the Assam Bengal Railway for 12 superheated boilers for H/5 and M/1 class 4-6-0 locomotives and two superheated boilers for C/2 class 2-6-2T locomotives.

The East Indian Railway has placed the following orders for locomotive boilers:—North British Locomotive Co. Ltd.: 16 boilers for SG class 0-6-0 locomotives and six boilers for BT 2-6-4T locomotives; Werkspoor N.V.: six boilers for conversion of B.E.S.A. 4-6-0 Pe 1 class engines. These orders are to the inspection of the consulting engineers, Messrs. Rendel, Palmer & Tritton.

D. Wickham & Co. Ltd. has received an order from the South African Railways and Harbours Administration for three petrol-driven saloon inspection railcars with Ford engines.

D. Wickham & Co. Ltd. has also received an order from the Buenos Ayres Western Railway for 24 standard petrol-driven gang motor trolleys for the transport of permanent way men.

Large Russian Orders

The U.S.S.R. Railways Administration, through Arcos Limited, has placed orders to the value of about £500,000, payable in cash, for a total of 22,000 wheels and axles for 20 and 50-ton wagons as follow:—Taylor Bros. & Co. Ltd.: 6,720 pairs solid wheels and axles and 3,370 pairs disc wheels and axles; Owen & Dyson Limited: 2,880 pairs solid wheels and axles and 2,100 pairs disc wheels and axles; J. Baker-Bessemer Limited: 2,400 pairs solid wheels and axles and 2,530 disc wheels and axles; and William Beardmore & Co. Ltd.: 2,000 pairs disc wheels and axles. Large orders for steel and machinery for general purposes in the U.S.S.R. are also announced involving altogether a sum of more than £1,000,000 cash.

Bolsover Colliery Co. Ltd. has placed orders for 100 12-ton open wagons for coal traffic with each of the following firms:—W. H. Davis & Sons and S. J. Claye Limited. These firms have placed orders with Taylor Bros. & Co. Ltd. for the 400 pairs of light type solid wheels and axles for this stock.

Leyland Motors Limited has received an order from Ribble Motor Services Limited for 48 oil-engined Tiger passenger vehicles.

New Zealand Railway Orders

The New Zealand Government Railways Administration has placed the following orders:—

Craven Brothers (Crane Division) Limited: Two 35-ton breakdown cranes to total value of £10,840.

The Steel Company of Scotland Limited: Steel for bridgework to total value of £5,000.

Dorman Long & Co. Ltd.: Steel channels and joists to total value of £3,500.

Thos. Firth & John Brown Limited: Steel axles to total value of £2,300.

Taylor Bros. & Co. Ltd.: Steel disc wheels to total value of £4,000.

The English Steel Corporation Limited: Steel tyres to total value of £2,000.

In addition, a number of smaller contracts, each of value less than £1,000, have been placed for materials, including coil springs, steel plates, tubes, galvanised sheets, spring steel and copper sheets, to a total approximate value of £5,654. The whole of these contracts are for 100 per cent. British material and manufacture.

The South African Railways and Harbours Administration has placed orders for spring steel to the values named with Rotherham Forge & Rolling Mill Co. Ltd. (£193 9s. 8d.) and Samuel Osborn & Co. Ltd. (£304 7s. 5d.).

New Locomotives for Brazil

W. G. Bagnall Limited has received an order from Parana Plantations Limited (São Paulo-Parana Railway), Brazil, for two metre-gauge 2-8-2 type locomotives with double-bogie tenders. These engines will have two outside cylinders 18½ in. diam. by 24 in. stroke, piston valves arranged above the cylinders and actuated by Walschaerts gear, coupled wheels 3 ft. 10½ in. diam., leading and trailing engine and tender wheels 2 ft. 6 in. diam., boiler working pressure 180 lb. per sq. in., Ross pop safety valves, boiler heating surface totalling 1,473 sq. ft., and superheater surface 322 sq. ft., grate area 32.33 sq. ft., adhesion weight 45.3 tons, weight in working order of engine and tender 93.91 tons, tractive effort at 85 per cent. boiler pressure 27,027 lb., and tender fuel capacity 400 cu. ft. and water capacity 3,200 galls. J. Stone & Co.'s electric headlight equipment will be fitted.

Diesel Locomotive Order

W. G. Bagnall Limited has also received an order from the Assam Railways & Trading Co. Ltd. for a 70/77-h.p. diesel-mechanical locomotive with Bagnall-Deutz two-cylinder two-stroke engine, and of generally similar design to the 50/55-h.p. locomotive supplied by the same firm to this administration last year as described

and illustrated in our *Diesel Railway Traction Supplement* of May 18, 1934.

The United Steel Co. Ltd. (Steel Peech & Tozer Branch) has received an order for 574 steel locomotive tyres from the Great Western of Brazil Railway.

The South Indian Railway Administration has placed the following orders: Ibbotson Bros. & Co. Ltd.: 1,125 helical and volute springs.

J. Stone & Co. Ltd.: 135 Tonum E locomotive electric headlights.

Baldwin Locomotive Works: 124 locomotive electric headlight generators.

All the foregoing equipment is to be supplied to the inspection of the consulting engineers, Messrs. Robert White & Partners.

The Sentinel Waggon Works Limited has received an order from Tata Limited for one Sentinel patent B.E. industrial convertible-type locomotive for 2-ft. gauge lines. This engine has been ordered for shipment to Calcutta and is intended for service on the Barabil-Malda Tramline survey work.

Central Brazil Electrification

A press message from Rio de Janeiro received on Wednesday states that the Government committee has recommended the acceptance of the Metropolitan-Vickers Electrical Company's tender for the electrification of the Central Brazil Railway. Particulars of the work, which is valued at £3,000,000, were published in our issues of May 18, 1934, and June 30, 1933, and as stated in the former issue the contract was awarded to the firm mentioned, and only the technical details remained to be settled.

The Vulcan Foundry Co. Ltd. has received an order for 20 locomotive steel crank axles of the built-up type from the Buenos Ayres Great Southern Railway.

New Locomotive for Jamaica

Nasmyth Wilson & Co. Ltd. has received an order from the Crown Agents for the Colonies for one two-cylinder 4-8-0 locomotive with double-bogie tender for the Jamaica Government Railways. The engine is required for mixed-traffic service on the main lines, and is designed for a tractive effort of approximately 33,700 lb. and a maximum axle load of 13½ tons.

The Assam-Bengal Railway invites tenders, receivable by February 20 at 80, Bishopsgate, London, E.C.2, for six I.R.S. class YK superheated 2-6-0 locomotives and tenders.

The Secretary, Indian Railway Board, New Delhi, invites tenders for 1,500 I.R.S. O type four-wheeled open wagons; 100 I.R.S. OM type four-wheeled open wagons and 450 I.R.S. CR type four-wheeled covered wagons, all for the 5 ft. 6 in. gauge and without wheels and axles. Tender forms are obtainable from the Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, and tenders are receivable at the office of the Deputy Director, Mechanical Engineering, Railway Board, New Delhi, by March 11.

OFFICIAL NOTICES

Bengal-Nagpur Railway Company Limited

THE Directors are prepared to receive Tenders for:—
100 PAIRS I.R.S. WHEELS WITH STEEL AXLES.

Specification and Form of Tender can be obtained at the Company's Offices, 132, Gresham House, Old Broad Street, London, E.C.2, on or after Monday, 28th January, 1935.

A fee of 10s. will be charged for each copy of the Specification, which is NOT returnable. Tenders must be submitted not later than NOON on Thursday, 7th February, 1935. The Directors do not bind themselves to

accept the lowest or any Tender, and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
R. GRANT,
Secretary.

THE ASSAM-BENGAL RAILWAY CO. LTD. is prepared to receive Tenders for:—

6 LOCOMOTIVE ENGINES AND TENDERS I.R.S. "YK" 2-6-0 SUPERHEATED TYPE. Specifications and Tender Forms may be obtained at the Offices of the Company, 80, Bishopsgate, E.C.2. A fee of £1 ls. is charged

for each Specification, which cannot be returned.

Drawings may be had at the cost of the tenderer by application to Messrs. Hodges, Bennett & Co. Ltd., 16, Victoria Street, Westminster, S.W.1.

Tenders must be delivered at the Company's Offices not later than noon on Wednesday, the 20th February, 1935.

The Directors do not bind themselves to accept the lowest or any Tender.

By Order of the Board,
W. H. J. GORE,
Secretary.

26th January, 1935.

Great Western Railway and Plymouth**Speeches by Sir Robert Horne and Mr. Charles Hambro**

Sir Robert Horne, G.B.E., K.C., M.P., Chairman of the Great Western Railway Company, continuing his series of visits to the principal industrial centres served by the G.W.R., visited Plymouth last Wednesday. It will be remembered that visits have already been made to Cardiff, Newport, and Swansea.

On Wednesday morning an inspection was made of the facilities at Plymouth for dealing with ocean passenger traffic and freight traffic. The inspection included the Mill Bay pier; the tenders, waiting rooms and customs accommodation; the Trinity pier for general cargo; the Clyde pier for general coasting vessels and the West wharf for grain and freight imports.

Sir Robert Horne was accompanied by Lord Palmer and Mr. C. J. Hambro, Deputy Chairman, and Lord Mildmay of Flete, and the Earl of Mount Edgumbe, Directors; Sir James Milne, General Manager; Mr. C. R. Dashwood, Assistant General Manager; Mr. F. R. E. Davis, Secretary; Mr. H. I. Wilkinson, Superintendent of the Line; Mr. F. R. Potter, Principal Assistant to the Superintendent of the Line; Mr. A. Maynard, Chief Goods Manager; Mr. R. Carmichael, Chief Engineer; Mr. C. B. Collett, Chief Mechanical Engineer; Mr. C. S. Page, Chief Docks Manager; Mr. W. J. Thomas, Marine Manager; Mr. J. H. Parker, District Traffic Manager, Plymouth; Mr. E. W. Gould, Dock Manager, Plymouth; Mr. E. Lake, Divisional Engineer, Plymouth; Mr. A. W. H. Christison, Divisional Locomotive Superintendent, Newton Abbot; and Captain Wall, Dock Master.

Mr. E. C. Cox, C.B.E., M.V.O., Traffic Manager, Southern Railway, was also present at the invitation of the Great Western Railway Company.

Following the inspection, the Great Western Railway Company entertained a representative gathering of the principal trading interests of Plymouth, at the Royal Hotel, at which Sir Robert Horne presided.

Mr. Charles Hambro, a Deputy Chairman, Great Western Railway, in proposing the toast of "The City and Trade of Plymouth," said he had always understood that the trade and prosperity of Plymouth were bound up with the sea. If they looked back through history they found that the prosperity, wealth, contentment and order in "this great city" has been built up on the sea trade of the country. "We look upon Plymouth as the greatest

city in the world," he said. "Why? Because we think you were the first to realise the value of advertising. Little did the burgesses of Plymouth realise when they persuaded a great admiral to try out their bowling green what he was going to do for Plymouth in the future. He started the greatest advertising slogan when he said: 'We will finish the game and beat the Spaniards afterwards.' Every boy and girl who has attended school knows of the existence of Plymouth Hoe. Owing to circumstances beyond your control a great deal of the trade which belonged to this port has gone elsewhere. But, as you say, Plymouth will become a tourist centre if it cannot become a trading centre. Plymouth is the only one of the great mediaeval ports of England that has kept up with the times. You have encouraged flying. You have your own air service and your own flying ground, and two of the last flights to Australia started here, from Plymouth Sound. Then, too, the Great Western Railway, in conjunction with Imperial Airways, started the first internal air service in England here."

The Mayor of Plymouth (Alderman J. E. Pillar), in reply, said Plymouth was becoming more and more of a holiday centre. An aerodrome was a necessity, and he was anticipating the time when an air service across the Atlantic Ocean would be an accomplished fact.

Sir Robert Horne, in responding to the toast of "The Great Western Railway Company" (proposed by Mr. R. J. Mitchell, Chairman of the Plymouth Chamber of Commerce), said there was no new idea to which the G.W.R. was not responsive, and there was nothing its officials were not prepared to consider, as was evinced by their interest in air travel.

"We are prepared to develop Plymouth as a centre of foreign traffic, but we need the support of the business people in the city," he said.

"We have undoubtedly improved upon our receipts of last year, but we are still far from the highest year's total,

and we are very much behind normal conditions. We have progressed, but because we have progressed we cannot indulge in profligate expenditure. Our goods traffic has increased in Plymouth, but it is still below the best year of 1927. Passenger traffic has increased, but it is immeasurably below 1927. We have a long leeway to make up before we come back to anything like the prosperous times of old.

"I gather from the local newspapers and some of the remarks made by speakers here to-day that unduly optimistic anticipations have been formed as to what we are about to do in this community.

"We have always had our eye on North Road station at Plymouth and thought that by making certain economies we could justify expenditure on it. That has been our object. We found on closer examination that the cost would be between £250,000 and £300,000. We cannot possibly justify at the present moment that expenditure, and our engineers are even now considering some modified scheme which would not prevent the adoption of the other which we anticipate will be carried out in the future.

"There is one thing that will enable us to go, as you may term it, 'the whole hog.'" A great deal of the expenditure in which we have indulged during the last five years has been justified by a scheme instituted by the Government in 1929. That encouraged the railways to expend money on various improvements by offering to bear the cost of interest on sums expended for a period of fifteen years. Unfortunately, to-day it is said that these schemes are to come to an end. I do not believe it, and I am sure this community will back us up if we suggest the extension of the concession to the Government. If we are lucky enough, and we should be, you may take it that if we get that kind of support North Road station will have first chance of consideration."

Continuing, Sir Robert Horne added that a new situation had arisen through the departure of the French Line on its outward sailings from Plymouth. That company was going to use Southampton for its outward sailings, but that did not reflect upon Plymouth or the G.W.R. The explanation was that the change was due to the time the vessels left the French coast and the time they arrived here.

Railway Share Market

The stock and share markets have had to overcome this week a pessimistic tendency, partly resulting from financial troubles in the commodity markets and partly owing to uncertainty regarding the outcome of the gold clause dispute in the United States. As far as Home railway stocks are concerned, hopes were not realised that the satisfactory agreement as to the constitution of the new railway tribunal would recreate confidence in the stocks of the company which had been shaken by the references to further claims for wages reconsideration.

A larger amount of stock in the four grouped companies has been put on the market for sale during the last fortnight

than is disclosed by inference in the number of markings of business. It is conceded that Stock Exchange dealers have shown a responsive attitude to the offer of some fair-sized blocks of stock, especially in the fixed interest-bearing prior lien class. The shortage of gilt-edged stocks giving a good yield is sufficient to keep the demand for debenture stocks of the home railway companies fairly constant. In the more speculative stocks there has been a tendency to let the market take its course, and this has been against holders. London & North Eastern issues were adversely affected by the unqualified reference of the chairman at Tuesday's meeting of the British Railway Stockholders' Union to the recent improvement in railwaymen's wages as "wholly premature," but chiefly on account of the statement as to the company's expendi-

ture. Great Western ordinary stock failed to maintain the full advance resulting from unofficial estimates that 3 per cent. dividend will again be paid on the stock for the past year. Mersey issues were among the few railway stocks to harden in price, and the demand for the 3 per cent. preference stock found the market short of stock.

London Transport "C" stock again again showed weakness and fell to eight points lower than ruled a few weeks ago. Foreign railway stocks were lower all round, the conditions reported from Argentina, Uruguay, Brazil and Chile being unfavourable to any improvement in quotations. Uruguay issues were lowered on the news of internal troubles, but the market was largely nominal. Cordoba Central debenture stock failed to respond to a better traffic return.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

Railways	Miles open 1934-35	Week Ending	Traffic for Week		No. of Week	Aggregate Traffic to Date			Shares or Stock	Prices						
			Total this year	Inc. or Dec. compared with 1934		Totals		Increase or Decrease		Highest 1934	Lowest 1934	Jan. 30, 1935	Yield % (See Note)			
						This Year	Last Year									
South & Central America.	Antofagasta (Chili) & Bolivia	830	27.1.35	12,390	—	£ 430	4	£ 41,050	£ 46,830	—	£ 5,780	Ord. Stk.	263 ¹ / ₂	19	19	NH
	Argentine North Eastern	753	26.1.35	8,339	—	199	30	219,879	261,943	—	42,064	A. Deb.	11	67 ¹ / ₂	7	NH
	Argentine Transandine ..	111	—	—	—	—	—	—	—	—	—	6 p.c. Db.	52	45	50	8
	Bolivar ..	174	Dec., 1934	5,700	+	350	52	71,400	72,700	—	1,300	Bonds.	10	61 ¹ / ₂	10	NH
	Brazil ..	—	—	—	—	—	—	—	—	—	—	Ord. Stk.	136 ¹ / ₂	107 ¹ / ₂	13	315 ¹ / ₂
	Buenos Ayres & Pacific	2,806	26.1.35	78,281	—	17,625	30	2,075,874	2,455,831	—	379,957	Ord. Stk.	161 ¹ / ₂	81 ¹ / ₂	8	NH
	Buenos Ayres Central ..	190	13.1.35	378,600	—	25,400	28	3,279,700	3,216,900	—	62,800	Mt. Db.	23	10	21 ¹ / ₂	NH
	Buenos Ayres Gt. Southern	5,085	26.1.35	186,875	—	2,136	30	3,857,728	7,272,124	—	869,396	Ord. Stk.	35	22	24	NH
	Buenos Ayres Western ..	1,930	26.1.35	49,441	—	3,847	30	1,260,741	1,578,193	—	317,452	"	27 ¹ / ₂	181 ¹ / ₂	21	NH
	Central Argentine ..	3,700	26.1.35	136,807	—	16,617	30	3,488,446	4,096,289	—	607,843	"	23	131 ¹ / ₂	14	NH
	Do. ..	—	—	—	—	—	—	—	—	—	—	Divd.	14	7	8	NH
	Cent. Uruguay of M. Video	273	26.1.35	18,624	+	873	30	495,958	489,040	+	6,918	Ord. Stk.	151 ¹ / ₂	8	81 ¹ / ₂	NH
	Do. Eastern Extn.	311	26.1.35	3,955	—	225	30	104,480	94,907	+	9,573	—	—	—	—	—
	Do. Northern Extn.	185	26.1.35	2,214	+	415	30	55,634	51,927	+	3,707	—	—	—	—	—
	Do. Western Extn.	211	26.1.35	1,880	—	337	30	44,580	46,591	—	2,011	—	—	—	—	—
	Cordoba Central ..	1,218	26.1.35	27,660	+	670	30	885,620	1,110,780	—	225,160	Ord. Inc.	6	3	31 ¹ / ₂	NH
	Costa Rica ..	188	Nov., 1934	17,520	—	1,014	17	81,005	99,724	—	18,719	Stk.	305 ¹ / ₂	231 ¹ / ₂	31	67 ¹ / ₂
	Dorada ..	70	Dec., 1934	8,100	—	2,900	52	120,900	96,800	+	24,100	1 Mt. Db.	103	95	102 ¹ / ₂	57 ¹ / ₂
	Entre Rios ..	810	26.1.35	15,909	+	3,192	30	376,262	402,301	—	26,039	Ord. Stk.	211 ¹ / ₂	12	131 ¹ / ₂	NH
	Great Western of Brazil	1,082	26.1.35	11,500	—	400	4	41,000	45,700	—	4,700	Ord. Sh.	7 ¹ / ₂	5 ¹ / ₂	8	NH
	International of Cl. Amer.	794	Nov., 1934	\$365,862	+	\$18,171	47	\$4,311,914	\$4,125,766	+	\$186,148	1st Pref.	1/-	1/-	—	NH
Interoceanic of Mexico ..	2,254	Dec., 1934	3,200	—	200	52	42,350	55,670	—	13,320	Stk.	125 ¹ / ₂	7 ¹ / ₂	81 ¹ / ₂	NH	
La Guaira & Caracas ..	225 ¹ / ₂	Dec., 1934	23,344	+	1,071	4	91,616	73,131	+	18,485	Ord. Stk.	146 ¹ / ₂	7	71 ¹ / ₂	NH	
Leopoldina ..	1,918	26.1.35	23,344	+	1,071	4	91,616	73,131	+	18,485	"	34	11 ¹ / ₂	11 ¹ / ₂	NH	
Mexican ..	483	21.1.35	\$253,000	+	\$29,300	3	\$665,400	\$588,700	+	\$76,700	"	11 ¹ / ₂	12	11 ¹ / ₂	NH	
Midland of Uruguay ..	319	Dec., 1934	13,508	—	1,966	26	65,833	57,230	+	8,603	"	11 ¹ / ₂	12	11 ¹ / ₂	NH	
Nitrate ..	401	15.1.35	4,700	—	11,255	2	4,700	15,955	—	11,255	Ord. Sh.	329 ¹ / ₂	51 ¹ / ₂	28 ¹ / ₂	NH	
Paraguay Central ..	274	26.1.35	5,240	+	2,350	30	189,780	97,890	+	41,890	Pr. Li. Stk.	84	67	78 ¹ / ₂	7 ¹ / ₂	
Peruvian Corporation ..	1,059	Dec., 1934	61,978	+	7,227	26	371,516	329,691	+	41,825	Pref.	141 ¹ / ₂	8	9	NH	
Salvador ..	100	19.1.35	\$32,500	—	\$5,500	29	\$425,652	\$440,433	—	\$14,781	Pr. Li. Db.	75	70	70	7 ¹ / ₂	
San Paulo ..	1,532	20.1.35	32,221	—	955	3	90,461	87,057	—	3,404	Ord. Stk.	86	67	68	57 ¹ / ₂	
Talital ..	164	Dec., 1934	2,140	—	1,483	26	13,870	12,515	—	1,055	Ord. Sh.	21 ¹ / ₂	17 ¹ / ₂	18 ¹ / ₂	51 ¹ / ₂	
United of Havana ..	1,365	26.1.35	23,383	+	8,902	30	490,766	394,398	—	96,368	Ord. Stk.	6	2	3	NH	
Uruguay Northern ..	73	Dec., 1934	1,528	—	230	26	7,294	7,383	—	89	Deb. Stk.	61 ¹ / ₂	4	51 ¹ / ₂	NH	
Canada.	Canadian National ..	23,733	21.1.35	549,589	+	12,099	3	1,583,644	1,536,062	+	47,582	—	781 ¹ / ₂	511 ¹ / ₂	771 ¹ / ₂	51 ¹ / ₂
	Canadian Northern ..	—	—	—	—	—	—	—	—	—	—	Perp. Dbs.	781 ¹ / ₂	511 ¹ / ₂	771 ¹ / ₂	51 ¹ / ₂
	Grand Trunk ..	—	—	—	—	—	—	—	—	—	—	4 p.c. Gar.	1041 ¹ / ₂	971 ¹ / ₂	103	57 ¹ / ₂
	Canadian Pacific ..	17,243	21.1.35	391,000	—	4,000	3	1,047,200	1,173,600	—	26,400	Ord. Stk.	1861 ¹ / ₂	111 ¹ / ₂	14	NH
India.	Assam Bengal ..	1,329	29.12.34	24,495	+	2,504	39	1,049,166	915,987	+	133,179	Ord. Stk.	881 ¹ / ₂	72	901 ¹ / ₂	351 ¹ / ₂
	Barsi Light ..	202	5.1.35	2,445	—	180	40	108,525	116,212	—	7,687	Ord. Sh.	1041 ¹ / ₂	983 ¹ / ₂	1041 ¹ / ₂	55 ¹ / ₂
	Bengal & North Western	2,113	5.1.35	47,994	—	2,429	14	642,719	659,915	—	17,196	Ord. Stk.	2971 ¹ / ₂	262	2941 ¹ / ₂	571 ¹ / ₂
	Bengal Doonars & Extension	161	5.1.35	2,910	—	1,264	40	120,465	120,270	+	195	"	1251 ¹ / ₂	124	1261 ¹ / ₂	51 ¹ / ₂
	Bengal-Nagpur ..	3,269	22.12.34	116,850	+	3,696	38	4,164,639	3,886,035	+	278,604	"	1051 ¹ / ₂	96	1041 ¹ / ₂	315 ¹ / ₂
	Bombay, Baroda & Cl. India	3,072	19.1.35	193,350	—	23,925	42	6,457,575	6,156,750	+	300,825	"	115	1081 ¹ / ₂	1141 ¹ / ₂	51 ¹ / ₂
	Madras & South'n Mahratta	3,230	29.12.34	107,400	—	1,213	39	4,147,038	4,181,589	—	34,551	"	131	1223 ¹ / ₂	1271 ¹ / ₂	77 ¹ / ₂
	Rohilkund & Kumaon ..	572	5.1.35	11,311	—	728	14	126,564	116,958	—	9,606	"	263	250	2701 ¹ / ₂	515 ¹ / ₂
	South India ..	2,526	29.12.34	75,973	+	649	39	3,098,635	3,037,994	+	60,641	"	119	115	117	615 ¹ / ₂
	Beira-Umtali ..	204	Nov., 1934	64,355	+	14,678	9	125,490	99,606	+	25,884	—	—	—	—	—
Various.	Bilbao River & Cantabrian	15	Dec., 1934	1,614*	—	626	52	19,947	18,960	+	967	—	—	—	—	—
	Egyptian Delta ..	621	10.1.35	7,233	—	125	41	187,487	184,196	+	3,291	Prf. Sh.	213 ¹ / ₂	13 ¹ / ₂	23 ¹ / ₂	41 ¹ / ₂
	Great Southern of Spain	104	19.1.35	2,354	—	54	3	6,748	7,322	—	574	Inc. Deb.	4	31 ¹ / ₂	31 ¹ / ₂	NH
	Kenya & Uganda ..	1,625	Dec., 1934	196,966	+	41,493	52	2,227,178	2,088,162	+	139,016	B. Deb.	50	33	48	75 ¹ / ₂
	Manila ..	—	—	—	—	—	—	—	—	—	—	1 Mg. Db.	101	915 ¹ / ₂	1031 ¹ / ₂	415 ¹ / ₂
	Mashonaland ..	913	Nov., 1934	115,238	+	23,474	9	232,511	186,337	+	46,174	Inc. Deb.	100	93	961 ¹ / ₂	551 ¹ / ₂
	Midland of W. Australia	277	Nov., 1934	15,075	+	2,507	21	71,429	65,112	+	6,317	"	—	—	—	—
	Nigerian ..	1,905	8.12.34	68,487	+	11,917	36	1,220,148	1,009,085	+	211,063	"	—	—	—	—
	Rhodesia ..	1,538	Nov., 1934	185,477	+	29,280	9	375,036	316,298	+	58,738	4 p.c. Db.	1047 ¹ / ₂	971 ¹ / ₂	105	315 ¹ / ₂
	South African ..	13,217	5.1.35	492,127	—	59,285	40	20,531,595	18,091,416	+	2,440,179	—	—	—	—	—
	Victorian ..	6,172	Sept., 1934	706,537	—	34,089	13	2,139,677	2,120,671	+	19,006	—	—	—	—	—
	Zafra & Huelva ..	112	Nov., 1934	11,562	—	636	47	127,888	123,827	+	4,061	—	—	—	—	—

* Rebellion.

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. ‡ Ex dividend. Salvador receipts are in currency. The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rate of exchange and not on the par value.